

**INITIAL STATEMENT OF REASONS
OF THE
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT**

**REGARDING PROPOSED CHANGES TO THE
CALIFORNIA BUILDING STANDARDS ADMINISTRATIVE CODE
AND
CALIFORNIA BUILDING CODE
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PARTS 1 & 2**

The Administrative Procedure Act (APA) requires that an Initial Statement of Reasons be available to the public upon request when rulemaking action is being undertaken. The following information required by the APA pertains to this particular rulemaking action:

STATEMENT OF SPECIFIC PURPOSE AND RATIONALE: The Office of Statewide Health Planning and Development (OSHPD) is proposing to:

- Amend 2007 CBC by adopting the American Society of Civil Engineers' (ASCE) ASCE 41-06, *Seismic Rehabilitation of Existing Buildings* as a referenced standard.
- Amend Title 24, Part 1, 2007 California Building Standard Administrative Code (CAC) Chapters 6 & 7 to facilitate compliance with seismic safety requirements and making them consistent with Title 24, Part 2, 2007 California Building Code (CBC).
- Update 2007 CAC earthquake repair provisions in Chapter 7, Article 20 for consistency with the 2007 CBC.
- Amend 2007 CBC by repealing the Federal Emergency Management Agency's (FEMA) FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings* as a reference standard.
- Relocate existing & necessary amendments of FEMA 356 into the ASCE 41-06.
- Amend 2007 CBC by adopting the Post-Tensioning Institute (PTI) PTI-2004, *Recommendations for Prestressed Rock and Soil Anchors (4th Edition)* for design of seismic tie-down anchors.
- Amend 2007 CBC to require Steel Eccentric Brace Frame (EBF) and Special Concentric Braced Frame (SCBF) based on Hollow Structural Sections (HSS) advisory issued by the American Institute of Steel Construction (AISC).

ASCE 41-06 is a consensus national standard for seismic rehabilitation of existing buildings. This standard will be adopted as a reference standard in the 2007 CBC and will replace FEMA 356, a prestandard that served as a starting point for the development of the ASCE 41-06. ASCE 41-06 is a valuable tool for structural engineers and the public for improving seismic performance of existing buildings. The completion of the new standard represents a considerable advancement for the engineering community. ASCE 41-06 will require less seismic base shear or target displacements, compared to FEMA 356, in some areas of California. Also, non-structural component design provision will be relaxed similar to changes from the 2001 CBC to 2007 CBC. Since both ASCE 7-05 and ASCE 41-06 non-structural provisions are based on 2003 NEHRP Provisions (FEMA 450, Parts 1 & 2), there will be uniformity in requirements for new and existing buildings. This adoption will substantially reduce the number of project specific design criteria, prepared by engineers and approved by OSHPD, for seismic evaluation and retrofit of hospital buildings.

FEMA 356 was adopted by OSHPD in the 2007 CBC during the California Building Standards Commission's 2006 Triennial Code Adoption Cycle because ASCE 41-06 was not yet published and therefore, not available for public review / comment. A draft copy of the ASCE 41-06, however, was made available to OSHPD during code adoption cycle but the standard was substantially incomplete with a number of tables and figures missing. Amending a partially complete standard to achieve OSHPD's statutory goal of operational / immediate occupancy for hospital buildings was not feasible.

ASCE 41-06 became officially available in May 2007 and OSHPD is taking immediate steps for its adoption so that requirements for seismic rehabilitation of existing buildings, including hospitals and skilled nursing facilities, will align more closely with the new building code provisions in the 2007 CBC. OSHPD's adoption of ASCE 41-06 is consistent with the standards adopted by Division of State Architect – Structural Safety (DSA-SS), California universities and

other state buildings. Additionally, practicing engineers will need to learn only one standard, ASCE 41-06, for seismic rehabilitation of existing buildings instead of learning two separate standards, FEMA 356 and ASCE 41-06.

Title 24, Part 1

Chapter 6 - Seismic Evaluation Procedures for Hospital Buildings

Administrative regulations in Title 24, Part 1, Chapter 6 regarding SB 1953 (Chapter 740, Statutes of 1994) seismic safety requirements are being amended to be consistent with the 2007 CBC. These revisions will not affect any existing Structural Performance Category (SPC) or Nonstructural Performance Category (NPC) rating of existing hospital buildings.

Section 1.2 Definitions – “Alternate Analysis” is being amended to “Alternative Analysis” for consistency with Section 2.7.

Section 1.4.5.1 – CBC chapter reference in this section is being amended for consistency with the 2007 CBC.

Section 1.4.5.1.1 – CBC chapter reference in this section is being amended for consistency with the 2007 CBC.

Section 1.5.2 – The California Division of Mines and Geology is being amended because the division has been renamed to the California Geological Survey pursuant to SB 668 (Chapter 869, Statutes of 2006). Also, the 1998 CBC section reference is being revised for accuracy.

Section 2.1.1 – Specific reference to the 1995 CBC will provide consistency and will permit continued use of existing engineering geologic reports developed pursuant to SB 1953 requirements.

Section 2.4.9.2 – Specific reference to the National Earthquake Hazards Program’s (NEHRP) 1994 NEHRP Recommended Provisions’ for steel in Chapter 5 will provide consistency.

Section 2.4.9.4 – Specific reference to 1994 NEHRP, Recommended Provisions for masonry in Chapter 8 will provide consistency.

Section 2.4.10.1 – Specific reference to the 1995 CBC will provide consistency and will permit continued use of existing ground motion data developed pursuant to SB 1953 requirements.

Section 2.7 – CBC section reference is being revised to be consistent with the 2007 CBC. Revisions in this section will eliminate the need for Alternate Means of Compliance (AMC) / Design Criteria (DC) for Linear Static Procedure (LSP), Linear Dynamic Procedure (LDP) and Non-Linear Static Procedure (NSP).

Section 4.1.1 – This section is amended to provide clarification for uniform enforcement.

Section 4.2.10 – Specific reference to the 1995 CBC will provide consistency. This will permit continued use of existing requirements pursuant to SB 1953 requirements.

Section 6.1.6 – Specific reference to the 1995 CBC will provide consistency. This will permit continued use of the provisions in 1995 CBC pursuant to SB 1953 requirements.

Section 6.1.7 – Specific reference to the 1995 CBC will provide consistency. This will permit continued use of the provisions in the 1995 CBC pursuant to SB 1953 requirements.

Section 11.2.2 – Specific reference to the 1995 CBC will provide consistency. This will permit continued use of the provisions in the 1995 CBC pursuant to SB 1953 requirements.

Section 11.3.1 – Specific reference to the 1998 CBC will provide consistency. This will permit continued use of the provisions in the 1998 CBC pursuant to SB 1953 requirements.

Section 11.3.2 – Specific reference to the 1998 CBC will provide consistency. This will permit continued use of the provisions in the 1998 CBC pursuant to SB 1953 requirements.

Section 11.3.5 – Specific reference to the 1998 CBC will provide consistency. This will permit continued use of the provisions in the 1998 CBC pursuant to SB 1953 requirements.

Table 11.1 – Specific reference to the 2001 CBC in Table 11.1, Footnote 1 will provide consistency. This will permit continued use of the provisions in the 2001 CBC pursuant to SB 1953 requirements.

Title 24, Part 1

Chapter 7 - Safety Standards for Health Facilities

Administrative provisions in Title 24, Part 1, Chapter 7 are being revised for consistency with the 2007 CBC. The amendments will facilitate compliance with SB 1953 seismic safety regulations. In addition, earthquake damage repair provisions in Article 20 of this chapter are being updated so that if hospital buildings are repaired they can retain their SPC and NPC ratings.

Section 1.2 Definitions –

“Addition” is being revised to be consistent with ASCE 7-05 Section 11.2. ASCE 7-05 is the primary basis for structural design in the 2007 CBC.

“Maximum Probable Earthquake” definition is being deleted because it is not used in the 2007 CBC.

“Primary Gravity Load Resisting System” and **“Seismic Force Resisting System”** definitions are being added for clarity because these terms are used in Section 7-125 and in the 2007 CBC .

“Upper Bound Earthquake” is being deleted because it is not used in the 2007 CBC.

Section 7-117 - Site data requirement in this section is being revised to be consistent with the 2007 CBC, Section 1802A.6.

Section 7-125 -This section clarifies current OSHPD requirement of not permitting primary vertical or lateral load resisting systems and stirs to be deferred per the 2007 CAC Section 7-125 (c)(3)(D).

Section 7-302- Pre-1973 structures repair requirement for hospital buildings in this section are being revised to be consistent with the 2007 CBC, Section 3403A.

Section 7-303 - Post-1973 structures repair requirements for hospital buildings in this section are being revised to be consistent with the 2007 CBC, Section 3403A.

Section 7-304 - Type V Single Story Skilled Nursing Facilities (SNF) and Intermediate Care Facilities (ICF) repair requirements in this section are being revised to be consistent with the 2007 CBC, Section 3403.

Title 24, Part 2, Volume 2

Chapter 16A - Structural Design

Structural design provisions in this chapter are being revised on the basis of American Institute of Steel Construction (AISC) Hollow Structural Sections (HSS) advisory and an amendment approved for the International Building Code (IBC) in the 2006 / 2007 code cycle. The revisions will ensure that any Structural Performance Category (SPC) upgrade using steel Eccentrically Braced Frames (EBF) will achieve the target performance level required by SB 1953 regulations.

Section 1607A.7.1.3 – The stress increase that is currently required by this section is no longer appropriate given the latest editions of the referenced standards that properly coordinate Allowable Strength Design (ASD) with Load and Resistance Factor Design (LRFD) through a unified design process. Since the structural safety of handrails and

guards are predominantly governed by strength, the continued use of the one-third stress increase for handrails could lead to unconservative design. This repeals a provision in the model code per an amendment to 2006 International Building (IBC) approved by the International Code Council-Structural (ICC-S) committee for the 2006 / 2007 code cycle.

Section 1614.1.3 – This section is amended to require steel EBF to have moment resisting connections at columns away from the links. Recent research regarding steel Special Concentrically braced Frame (SCBF) at the University of California, Berkeley has indicated that SCBF columns develop fracture at drifts of 2% at the gusseted beam-column connection. Nominally pinned connections (i.e., connections not designed or detailed as moment connections) acted as rigid connections because of the presence of the gusset plate, and transferred moment between the beam and the column. The American Institute of Steel Construction Inc. (AISC) recommended providing a connection that can resist a moment equal to the lesser of the available flexural strength of the beam or the column. Since EBF's will have drift comparable to SCBF, recommendation for SCBF is also applicable to EBF.

Title 24, Part 2, Volume 2

Chapter 17A -Structural Tests and Special Inspections

Special inspection provisions in this chapter are being revised to require special inspection of cast-in-place anchor bolts. This will ensure that any SPC or NPC upgrade, where cast-in place anchor bolts are used will achieve the target performance level required by SB 1953 regulations.

Table 1704A.4 – This table is being amended to clarify special inspection requirements for cast-in-place anchor bolts. Design of anchor bolts, pursuant to ACI 318-05 Appendix D, is based on the assumption (ACI 318-05, Section 1.3) that they will receive special inspection. Clarification is needed to ensure that design assumption is followed.

Title 24, Part 2, Volume 2

Chapter 18A - Soils and Foundations

Rock and soil foundation anchors design provisions are being added to expedite design approval and to ensure uniformity in compliance with the SPC upgrade requirements pursuant to SB 1953 program.

Section 1813A – This section is amended to add requirements regarding the use of PTI-2004, *Recommendations for Prestressed Rock and Soil Anchors (4th Edition)* for design of seismic tie-down anchors. Currently, rock and soil foundation seismic anchor design requires submittal of Alternate Means of Compliance / Design Criteria for each project to be pre-approved by OSHPD. Having a well defined procedure in the 2007 CBC will ensure uniformity in compliance while reducing time required for plan approval.

Title 24, Part 2, Volume 2

Chapter 22A - Steel

Structural design provisions in this chapter are revised on the basis of AISC HSS advisory. This will ensure that any SPC upgrade using steel SCBF will achieve the target performance level required by SB 1953 regulations.

Section 2205A.4.1.5.2 – Revision in this section will require steel Special Concentrically Braced Frame (SCBF) to have moment resisting connections at columns. Recent research regarding steel SCBF at the University of California, Berkeley has indicated that SCBF columns develop fracture at drifts of 2% at the gusseted beam-column connection. Nominally pinned connections (i.e., connections not designed or detailed as moment connections) acted as rigid connections because of the presence of the gusset plate and transferred moment between the beam and the column. AISC recommended providing a connection that can resist a moment equal to the lesser of the available flexural strength of the beam or the column.

Title 24, Part 2, Volume 2

Chapter 34 - Existing Structures

Design provisions for existing structures are being revised by adopting ASCE 41-06 and repealing FEMA 356. This will ensure that the reference standards for skilled nursing facilities (Type V, single story, wood frame or light-steel frame) in Chapter 34 are consistent with Chapter 34A standards for hospital buildings.

Section 3403.2.3.3 – This section is being amended to adopt ASCE 41-06, which is a consensus national standard, and repeal FEMA 356, which is a prestandard and basis for ASCE 41-06. Rehabilitation objectives are clarified to be consistent with ASCE 41.

Title 24, Part 2, Volume 2

Chapter 34A - Existing Structures

Design provisions for existing structures are revised by adopting ASCE 41-06 and repealing FEMA 356. This will ensure that building upgraded pursuant to SB 1953 regulations will comply with a consensus national standard instead of FEMA-356, which is a prestandard and basis for the ASCE 41-06.

ASCE 41-06, *Seismic Rehabilitation of Existing Buildings*, is the latest generation of performance-based seismic rehabilitation methodology. This new national consensus standard was developed from the FEMA 356, *Prestandard and Commentary for the Seismic Rehabilitation of Buildings*, which served as a starting point for the formal standard development process. ASCE 41-06 represents state-of-the-art knowledge in earthquake engineering and is a valuable tool for the structural engineering profession to improve building performance in future earthquakes. It includes significant improvements in current understanding of building behavior in earthquakes, such as:

- Improved C-coefficients (these coefficients convert ground seismic spectral accelerations to base shear coefficient) for calculation of the pseudo-lateral force and target displacement based on recommendations in FEMA 440, Improvement of Nonlinear Static Seismic Analysis Procedures.
- Comprehensive soil-structure interaction provisions including kinematic effects and foundation damping effects.
- Revised acceptance criteria for steel moment frames to reflect final conclusions of the SAC (A partnership of Structural Engineers Association of California (SEAO), Applied Technology Council (ATC) and California Universities for Research in Earthquake Engineering (CURE)) Joint Venture research.
- Expanded acceptance criteria for concentrically braced frames defined as a function of brace slenderness, compactness and level of connection detailing.
- Updated nonstructural provisions to be consistent with current NEHRP provisions for new buildings, which are the basis for the 2007 CBC.

Section 3402A – Definitions in this section are being revised to be consistent with the ASCE 41-06.

Section 3403A.2.3.3 – This section is being revised to adopt ASCE 41-06, which is a consensus national standard, and repeal FEMA 356, which is a prestandard and basis for ASCE 41-06. Rehabilitation objectives are also clarified to be consistent with the ASCE 41-06.

Section 3403A.2.3.4 – This section correlates structural and non-structural performance levels defined in the Title 24, Part 1, 2007 CAC, Chapter 6 to those defined in ASCE 41-06. This section also will ensure that the current SPC or NPC rating of hospital buildings will not be affected by the adoption of the 2007 CBC. This change will allow the hospitals to comply with SPC / NPC requirements by using 2007 CAC and 2007 CBC only.

Section 3403A.2.3.5 – This section adds reference to earthquake damage repair requirements in the 2007 CAC.

Section 3411A – Section references are being revised to be consistent with section number changes resulting from the adoption of ASCE 41-06 standards.

Section 3412A – This section is being repealed in its entirety, since all the requirements that were covered in this section are included in ASCE 41-06.

Section 3413A – This section addresses modification to ASCE 41-06 to achieve statutory performance objectives for seismic evaluation and retrofit of existing hospital buildings including those required by SB 1953.

Section 3413A.1 – This section retains existing FEMA 356 amendments in the 2007 CBC which are relevant to ASCE 41-06. However, amendments to FEMA 356 that are not relevant to ASCE 41-06 are being repealed. Also, new amendments are being added to make ASCE 41-06 consistent with SB 1953 regulations in the 2007 CAC, Chapter 6.

Section 3413A.1.1 – This section requires seismic evaluation of buildings, pursuant to ASCE 41, except when mandated otherwise by SB 1953 regulations in 2007 CAC, Chapter 6.

Section 3413A.1.2 – Seismic hazard requirements are amended to be compatible with the 2007 CBC requirements.

Section 3413A.1.3 – This section retains the data collection requirement in the 2007 CBC.

Section 3413A.1.4 – This section retains limitations on use of linear procedures in the 2007 CBC.

Section 3413A.1.5 – This section retains the requirement for using non-linear dynamic analysis procedure when higher mode effects are significant in immediate occupancy buildings.

Section 3413A.1.6 – This section retains the requirements for expected material properties to be obtained by test for immediate occupancy buildings.

Section 3413A.1.7 – This section retains the requirements for addressing the inconsistencies between Equations 3.4 and 3.5.

Section 3413A.1.8 – This section retains the prohibition on use of unreinforced masonry in moderate to high seismic regions.

Section 3413A.1.9 – This section prohibits the use of simplified non-linear static procedure for hospital buildings. Partial modeling of structures is considered inappropriate for hospital buildings, which are required for immediate occupancy.

Section 3413A.1.10 – This section retains the drift limitation for linear procedure consistent with new building construction.

Section 3413A.1.11 – This section retains the requirements that primary components for immediate occupancy buildings shall satisfy primary component acceptance criteria.

Section 3413A.1.12 – This section retains the foundation strength and stiffness requirements.

Section 3413A.1.13 – This section retains the prohibition on use of presumptive capacities.

Section 3413A.1.14 – This section retains the prohibition on prescriptive expected capacities.

Section 3413A.1.15 – This section retains the requirements for flexible base assumptions to be based upon soil strength evaluation.

Section 3413A.1.16 – This section retains the requirements for considering seismic earth pressure when appropriate.

Section 3413A.1.17 – This section retains appropriate part of clarification for the acceptance criteria for non-linear structural steel components.

Section 3413A.1.18 – This section retains the requirement for heavily loaded wall piers to be considered in design.

Section 3413A.1.19 – This section retains the prohibition of unreinforced masonry.

Section 3413A.1.20 – This section retains the prohibition of unreinforced masonry.

Section 3413A.1.21 – This section retains the minimum shear reinforcement requirements in masonry wall.

Section 3413A.1.22 – This section retains the requirement for using non-linear dynamic analysis to verify analysis for base isolated structure.

Section 3413A.1.23 – This section retains the requirement for using non-linear dynamic analysis to verify analysis for base isolated structure.

Section 3413A.1.24 – This section retains the requirement for enforcement agency approval for production testing.

Section 3413A.1.25 – This section retains the requirement for enforcement agency approval for testing exemption.

Section 3413A.1.26 and 3413A.27 – These sections retain the requirement for using non-linear dynamic analysis to verify analysis for structures with dampers.

Section 3413A.1.28 – This section retains the requirement for enforcement agency approval for production testing.

Section 3413A.1.29 – This section retains the prohibition on simplified rehabilitation procedure.

Section 3413A.1.30 – This section defines the operational performance requirements consistent with 2007 CAC, Chapter 6, Table 11.1.

Section 3413A.1.31 – This section defines the ceiling performance requirements which will ensure displacement compatibility and performance goal for hospitals.

Section 3413A.1.32 – This section retains the requirements of SB 1953 regulations for general acute care hospitals.

Title 24, Part 2, Volume 2

Chapter 35 - Referenced Standards

References in this chapter are revised for consistency with amendments to the 2007 CBC Chapters 18A, 34 & 34A.

TECHNICAL, THEORETICAL, AND EMPIRICAL STUDY, REPORT, OR SIMILAR DOCUMENTS:

There are no technical, theoretical or empirical studies, report of similar documents.

CONSIDERATION OF REASONABLE ALTERNATIVES

The alternative to these proposed regulations would be to leave regulations as they are. The alternative was rejected, since state of the art design is desired for hospital buildings in California. Also, consistency between various parts of the Title 24 is paramount for safe design.

REASONABLE ALTERNATIVES THE AGENCY HAS IDENTIFIED THAT WOULD LESSEN ANY ADVERSE IMPACT ON SMALL BUSINESS.

There will be no adverse impact on small business.

FACTS, EVIDENCE, DOCUMENTS, TESTIMONY, OR OTHER EVIDENCE OF NO SIGNIFICANT ADVERSE IMPACT ON BUSINESS.

The regulations proposed will have no significant adverse impact on business.

- 1) For some buildings, seismic base shear will be less than what is currently adopted in the 2007 CBC because of improved C-coefficient for calculation of the pseudo-lateral force and target displacement based on FEMA 440, *Improvement of Nonlinear Static Seismic Analysis Procedure*. Also, acceptance criteria for some materials have been improved based on latest research, which may have a positive or negative cost impact based on the lateral load resisting system.
- 2) Component design forces will be smaller at higher elevations in some buildings and will be consistent with new code provisions in the 2007CBC, since both are based on current NEHRP provisions for new buildings. This will not have any cost impact, since 2007 CBC permit new building provisions to be used for all existing buildings.
- 3) Comprehensive soil-structure interaction provisions in the ASCE 41-06 including kinematic effects and foundation damping effects will permit reduction in base shear with proper modeling. This will add to the modeling / analysis cost, while reducing the construction cost.

DUPLICATION OR CONFLICTS WITH FEDERAL REGULATIONS

These regulations do not duplicate or conflict with federal regulations.

EFFECTIVE DATE OF REGULATIONS

These regulations will amend the 2007 California Building Code which will become effective January 1, 2008. In order to coordinate with the new code these proposed regulations shall also be effective on January 1, 2008.

**EXPRESS TERMS
FOR PROPOSED BUILDING STANDARDS
OF THE
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

REGARDING PROPOSED CHANGES TO
CALIFORNIA BUILDING CODE
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 1, CHAPTERS 6 & 7**

LEGEND FOR EXPRESS TERMS

1. Existing California amendments or code language being modified: All such language appears in *italics*, modified language is underlined.
2. New California amendments: All such language appears underline and in italics.
3. Repealed text: All such language appears in ~~strikeout~~.

EXPRESS TERMS:

CHAPTER 6. SEISMIC EVALUATION PROCEDURES FOR HOSPITAL BUILDINGS

ARTICLE 1. DEFINITIONS AND REQUIREMENTS

1.0 Scope. The regulations in this article shall apply to the administrative procedures necessary to implement the seismic retrofit requirements of the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983.

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1.2 Definitions. Unless otherwise stated, the words and phrases defined in this section shall have the meaning stated therein throughout Chapter 6, Part 1, Title 24.

Alternate Alternative Analysis means a complete seismic analysis using methodology approved in advance by the Office and meeting the criteria of Article 2, Section 2.7 of these regulations.

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1.4.5.1 Change in Seismic Performance Category. The SPC or NPC for a hospital building may be changed by the Office from the initial determination in Sections 1.3.3 or 1.3.4 provided the building has been modified to comply with the requirements of Chapter 34A ~~46B~~, Part 2 of Title 24 for the specified SPC or NPC.

1.4.5.1.1 – The SPC or NPC for a hospital building may be changed by the Office from the initial determination made per Sections 2.0.1.2.3 or 11.0.1.2.1 upon the following:

A Seismic Evaluation Report shall be submitted and approved which shall include either or both of the following:

- 1.1 A structural evaluation report in accordance with Section 1.3.3;
- 1.2 A nonstructural evaluation report in accordance with Section 1.3.4.

Exception: To change an NPC 1 hospital building to an NPC 2 under this section, the nonstructural evaluation may be limited in scope to the systems and equipment specified in Section 11.2.1.

2. The building has been modified to comply with the requirements of Chapter ~~46B~~ 34A, Part 2 of Title 24 for the specified SPC or NPC.

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1.5.2 Delay in Compliance

1. The Office may grant the hospital owner an extension to the January 1, 2008 seismic compliance deadline for both structural and nonstructural requirements if compliance will result in diminished health care capacity which cannot be provided by other general acute care hospitals within a reasonable proximity.

1.1 Hospital owners requesting an extension in accordance with Section 1.5.2 must submit an application form to the Office by January 1, 2007. The application form shall be accompanied by a statement explaining why the hospital is seeking the extension to the January 1, 2008 seismic compliance deadline. The statement shall include, at a minimum, the following information:

- (a) The length/duration of the extension request;
- (b) The hospital buildings requiring an extension; and
- (c) The acute care services that will be completely or partially unavailable if the extension is denied.

1.2 The hospital owner shall request an extension for seismic compliance in one year increments, up to a maximum of five (5) years, beyond the mandated year of compliance. The hospital owner shall also submit an amended compliance plan and schedule in accordance with Section 1.4.5 indicating when compliance will be obtained.

2. Any general acute care hospital located in Seismic Zone 3, as defined by Section ~~1627A.2~~ 1627B.2 of the 1998 California Building Code may request an exemption from the anchorage and bracing requirements of NPC 3 if all the following conditions are met:

- 2.1 The hospital must meet the anchorage and bracing requirements for NPC 2 by January 1, 2002;
- 2.2 The hospital shall submit a site-specific engineering geologic report, prepared in accordance with Section 1634B.1 of the 1998 California Building Code. The report shall include estimates of the effective peak ground acceleration (EPA) with a 10 percent probability of exceedance in 50 years;
- 2.3 The California Geological Survey (CGS) ~~Division of Mines and Geology (CDMG)~~ reviews and approves the findings of the site-specific engineering geologic report;
- 2.4 The site-specific engineering geologic report demonstrates that the estimated EPA with a 10% probability of exceedance in 50 years is less than 0.25 g.
- 2.5 The hospital owner requesting the exemption shall pay the actual costs of OSHPD and CGS ~~CDMG~~ for the review and approval of the site-specific engineering geologic report.

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ARTICLE 2. PROCEDURES FOR STRUCTURAL EVALUATION OF BUILDINGS

2.0 General

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2.1 Site Visit, Evaluation, And Data Collection Procedures

2.1.1 Site Visit And Evaluation

1. The evaluator shall visit the building to observe and record the type, nature, and physical condition of the structure.

2. The evaluator shall review an Engineering Geological Report on site geologic and seismic conditions. The report shall be prepared in accordance with Title 24, Section 1634A of 1995 California Building Code (CBC) or equivalent provision in later version of the CBC.

Exceptions:

1. Reports are not required for one-story, wood-frame and light steel-frame buildings of Type II or Type V construction and 4,000 square feet or less in floor area;
2. A previous report for a specific site may be resubmitted, provided that a reevaluation is made and the report is found by the Office to be currently appropriate.

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2.4.9 Element Capacities. Calculate element capacities on the ultimate-strength basis of the 1994 NEHRP Recommended Provisions.

When calculating capacities of deteriorated or damaged elements, the evaluator shall make appropriate reductions in the material strength, the section properties and any other aspects of the capacity affected by the deterioration.

2.4.9.2 Steel. The basic document is Chapter 5 6 of the 1994 NEHRP Recommended Provisions, as modified in Articles 4 and 6 of these regulations.

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2.4.9.4 Masonry. The basic document is Chapter 8 42 of the 1994 NEHRP Recommended Provisions, as modified in Article 5 of these regulations.

2.4.10 Dynamic Analysis. Unless otherwise noted, the procedures given in Articles 3 through 10 use the equivalent lateral force procedure. The use of a dynamic analysis procedure is required for the following:

- 1) Buildings 240 feet or more in height;
- 2) Buildings with vertical irregularities caused by significant mass or geometric irregularities;
- 3) Buildings where the distribution of the lateral forces departs from that assumed in the equivalent lateral force procedure; and
- 4) Where required by the evaluation statements in Articles 3 through 10.

Dynamic analysis procedures shall conform to the criteria established in this section. The analysis shall be based on an appropriate ground motion representation as specified in this section and shall be performed using accepted principles of dynamics. Structures that are evaluated in accordance with this section shall comply with all other applicable requirements.

2.4.10.1 Ground Motion. The ground motion representation shall be an elastic response spectra developed for mean values for the specific site, in accordance with the procedures in Title 24, Section 1629A.2 of 1995 California Building Code (CBC) or equivalent provision in later version of the CBC.

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2.7 Alternative Analysis. The owner of a building may elect to perform an Alternative Analysis, to evaluate a structure in more detail than that provided by the evaluation procedures specified in these regulations. The methodology of an Alternative Analysis must be approved in advance by OSHPD, and shall meet the following criteria:

1. Data collection on the structure and site conditions shall be performed in accordance with the appropriate Sections of Article 2 of these regulations. Depending upon the type of analysis to be performed, additional data regarding the as built condition and material properties may be required;
2. The Alternative Analysis shall be based on a site specific ground motion as specified in Section 2.4.10.1 3413A.1.2 of the 2007 California Building Code (CBC);

3. The analysis of the structure shall determine the distribution of strength and deformation demands produced by the design ground shaking and other seismic hazards. The analysis shall address seismic demands and capacities to resist these demands for all elements in the structure that either:
 - Are essential to the lateral stability of the structure (primary elements); or
 - Are essential to the vertical load carrying integrity of the building.
4. The analysis procedure may consist of a linear or nonlinear analysis. The analytical methods and acceptance criteria shall conform to Section 3403A.2.3.4 of the 2007 CBC and nonlinear time history analysis procedure shall be reviewed and approved, in advance, by OSHPD.

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ARTICLE 4. PROCEDURES FOR MOMENT RESISTING SYSTEMS

4.0 Introduction. Moment frames develop their resistance to lateral forces through the flexural strength and continuity of beam and column elements. Moment frames may be classified as special, intermediate, and ordinary frames.

For evaluations using these regulations, it is not necessary to determine the type of frame in the building. The issues are addressed by appropriate acceptance criteria in the specified procedures. For determination of element capacities, see Article 2, Section 2.4.9.

4.1 Frames With Infill Walls

4.1.1 Interfering Walls: All infill walls placed in moment frames are isolated from structural elements. For conforming buildings, the evaluator may consider this condition as mitigated, and no calculations are necessary. The deficiency is an inappropriate connection of the wall to the frame. Evaluate the relative strength and stiffness of the walls and frames, considering the nature and size of the joint or connection between the wall and the frame. If the strength of the walls is not commensurate with the stiffness, the building should be treated as Type 7 or Type 10 (Article 2, Section 2.2.3 "Common Building Types), a frame with infill walls. If the infill walls do not extend the full story height and are not properly isolated from the frame columns, evaluate the column shear demand and capacity, based on a column height equal to the clear distance from the top of wall to the bottom of the slab or beam above, amplifying the design forces in the short column by $C_d/2$, but not less than 1.5. The shear demand need not exceed the shear capacity corresponding to the flexural capacity of the column, based on a column height equal to the clear distance from the top of wall to the bottom of the slab or beam above.

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4.2.10 Pre-Northridge Earthquake Welded Moment Frame Joints. Welded steel moment frame beam-column joints are designed and constructed in accordance with recommendations in FEMA 267, Interim Guidelines: Evaluation, Repair, Modification and Design of Welded Steel Moment Frame Structures, August 1995.

For buildings constructed under permit issued after October 25, 1994, the evaluator may consider this condition as mitigated. The deficiency is in the ductility of the beam-column joint. The following procedures shall be used for categorizing buildings with welded steel moment frame joints:

Procedure for conforming buildings: Conforming buildings located in Seismic Zone 4 of 1995 California Building Code (CBC) or later version of the CBC, within a zone designated as being potentially subject to near field effects in strong ground shaking, shall be placed in SPC 3. All other conforming buildings shall be placed in SPC 4.

Procedure for nonconforming buildings: Nonconforming buildings shall be placed in SPC 2.

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ARTICLE 6. PROCEDURES FOR BRACED FRAMES

6.0 Introduction. Braced frames develop their resistance to lateral forces by the bracing action of diagonal members. The braces induce forces in the associated beams and columns so that all work together like a truss with all members subjected to stresses that are primarily axial.

A **Concentrically Braced Frame** has minor eccentricities in the joints of the frame that are accounted for in the design.

An **Eccentrically Braced Frame** has elements that are strictly controlled to combine a stiffening effect due to the diagonal braces with yielding in the link beams. Eccentrically braced frames are present only in conforming buildings.

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6.1.6 Connection Strength. All the brace connections are able to develop the yield capacity of the diagonals.

The deficiency is in the strength of the connections. Check the connection strength. Use a demand value that develops the tensile capacity of the brace or is 1.25 times the required seismic force. If connections in a conforming buildings cannot develop the yield capacity of the brace and do not meet the requirements of Part 2, Title 24, Section 2211A.9.3 of 1995 California Building Code (CBC) or equivalent provision in later version of the CBC, the building shall be placed in SPC 4.

6.1.7 Column Splices. All column splice details of the braced frames can develop the column yield capacity.

The deficiency is in the strength of the splice. Calculate the adequacy of the splice connection for all expected forces including gravity loads. Amplify the seismic load for partial penetration welded splices by the factor $C_d/2$ when the seismic load produces tension at the splice. If the column splice details in a conforming buildings cannot develop the yield capacity of the column and do not meet the requirements of Part 2, Title 24, Section 2211A.9.5 of 1995 California Building Code (CBC) or equivalent provision in later version of the CBC, the building shall be placed in SPC 4.

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ARTICLE 11. EVALUATION OF CRITICAL NONSTRUCTURAL COMPONENTS AND SYSTEMS

11.0 Introduction

This article covers nonstructural components and systems critical to patient care.

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11.2.2 Evaluation Procedures for NPC 3 and NPC 3R. The following steps shall determine if the building meets the criteria for NPC 3 or NPC 3R:

- a) Identify the specific nonstructural components and equipment that are subject to the requirements of NPC 2 and NPC 3 or NPC 3R;
- b) Conduct an inventory of components and equipment specified in Table 11.1, NPC 3 and NPC 3R, noting whether the components and equipment are anchored or braced;

Exception: Any general acute care hospital facility located in both a “rural area” as defined in Section 70059.1, Division 5, Title 22 and Seismic Zone 3 pursuant to 1995 California Building Code (CBC) or later version of the CBC shall comply with the fire sprinkler system anchorage and bracing requirements of NFPA 13, 1994 edition or subsequent standard by January 1, 2013.

- c) Determine the level of NPC 3 conformance desired.

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11.3 Testing Requirements For Evaluating The Performance Of Existing Mechanical Fasteners. A testing program shall be instituted to determine the capacity of mechanical fasteners used to anchor non-structural components including the bracing of pipes, ducts, and conduit, and the attachment of equipment and other components listed in the 1995 CBC, Part 2, Title 24, Table 16A-O. Anchors shall be categorized as either seismic bracing of pipes ducts or conduit or equipment and other component anchors.

11.3.1 Anchors Used in the Seismic Bracing of Pipes, Ducts, or Conduit. For anchors used in the seismic bracing of pipes, ducts, or conduit, the following shall apply:

1. 20% of the anchors (20 minimum) of a given size and type (wedge, shell and sleeve for expansion bolts), at each level of the structure shall be tension tested to 3 times the maximum calculated design load specified in Section 1630B of 1998 California Building Code (CBC) or equivalent provision in later version of the CBC but not less than 500 pounds. A minimum of one anchor in any 4-bolt group shall be tested assuming an equal distribution of the calculated force to the bolt group. One-quarter (1/4) inch diameter anchors need not be tested. Where none of the anchors in the group have calculated tension, testing shall consist of torque testing.

Exception: Internally threaded anchors, such as shell type anchors, shall be tested to 4 times the maximum calculated design loads. Attachment hardware shall be shimmed or removed prior to testing so that it does not prevent the possible withdrawal of the anchor.

2. If an anchor fails the tension test, 20 anchors, installed by the same trade, in the immediate vicinity of the failed anchor shall be tested prior to resuming to a 20% sampling rate for testing.

11.3.2 Anchors Used in the Attachment of Equipment and Other Components. For anchors used in the attachment of equipment and other components listed in the 1995 CBC, Part 2, Title 24, Table 16A-O, The following shall apply:

1. A minimum of one anchor of a given size shall be tension tested for each piece of equipment or other component under consideration. Where the number of anchors for the piece of equipment or component exceeds four, a minimum of 20% of the anchors shall be tension tested. Where none of the anchors in the group have calculated tension, testing shall consist of torque testing.
2. The tension test load shall be 3 times the maximum tension force calculated for an anchor in the attachment group using the design loads specified in Section 1630B of 1998 California Building Code (CBC) or equivalent provision in later version of the CBC or 500 pounds minimum. One-quarter (1/4) inch diameter anchors need not be tested.

Exception: Internally threaded anchors, such as shell type anchors, shall be tested to 4 times the maximum calculated design loads. Attachment hardware shall be shimmed or removed prior to testing so that it does not prevent the possible withdrawal of the anchor.

3. If a single anchor fails, all anchors in the attachment group shall be tested. If two (2) or more anchors fail, the component shall be retrofitted for the forces as for new construction.

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11.3.5 Allowable shear loads. Allowable shear loads on anchors shall be determined by either of the following:

1. Shear values listed in Table 19B-E of 1998 California Building Code (CBC) or equivalent provision in later version of the CBC, or;
2. Shear values shall be obtained by analysis using **Strength Design of Anchorage to Concrete**, Section A.6 published by the Portland Cement Association, 1999, with the specified reduction coefficient(s) to convert the "strength" values to allowable stress design values of 1.7.

Table 11.1 – NONSTRUCTURAL PERFORMANCE CATEGORIES

Time frames	Nonstructural Performance Category ¹	Description
	NPC 1	Buildings with equipment and systems not meeting the bracing and anchorage requirements of any other NPC.

January 1, 2002	NPC 2	<p>The following are braced or anchored in accordance with Part 2, Title 24¹:</p> <ul style="list-style-type: none"> communications systems, emergency power supply, bulk medical gas systems, fire alarm systems; and emergency lighting equipment and signs in the means of egress.
January 1, 2008	NPC 3 / NPC-3R	<p>The building meets the criteria for NPC “2” and in critical care areas, clinical laboratory service spaces, pharmaceutical service spaces, radiological service spaces, and central and sterile supply areas, the following components meet the bracing and anchorage requirements of Part 2, Title 24²:</p> <ul style="list-style-type: none"> Nonstructural components, listed in the 1995 CBC, Part 2, Title 24, Table 16A-O, Part 2. Exception: For NPC-3R, lateral bracing of suspended ceiling systems may be omitted in rooms with a floor area less than 300 square feet, provided the room is not an intensive care or coronary care unit patient room, angiography laboratory, cardiac catheterization laboratory, delivery room, operating room, or post-operative recovery room. Equipment, as listed in the 1995 CBC, Part 2, Title 24, Table 16A-O, “equipment” including equipment in the physical plant that service these areas. Exceptions: <ol style="list-style-type: none"> Seismic restraints need not be provided for cable trays, conduit and HVAC ducting. Seismic restraints may be omitted from piping systems, provided that an approved method of preventing release of the contents of the piping system in the event of a break is provided. Only elevator(s) selected to provide service to patient, surgical, obstetrical, and ground floors during interruption of normal power need meet the structural requirements of Part 2, Title 24¹. Fire sprinkler systems comply with the bracing and anchorage requirements of NFPA 13, 1994 edition or subsequent applicable standards. Exception: Acute care hospital facilities in both a rural area as defined by Section 70059.1, Division 5 of Title 22 and Seismic Zone 3 shall comply with the bracing and anchorage requirements of NFPA 13, 1994 edition or subsequent applicable standards by January 1, 2013.
	NPC 4	<p>The building meets the criteria for NPC “3” and all architectural, mechanical, electrical systems, components and equipment, and hospital equipment meet the bracing and anchorage requirements of Part 2, Title 24². This category is for classification purposes of the Office of Emergency Services.</p>
January 1, 2030	NPC 5	<p>The building meets the criteria for NPC “4” and on-site supplies of water and holding tanks for wastewater, sufficient for 72 hours emergency operations, are integrated into the building plumbing systems. As an alternative, hook-ups to allow for the use of transportable sources of water and sanitary waste water disposal have been provided. An on-site emergency system as defined within Part 3, Title 24 is incorporated into the building electrical system for critical care areas. Additionally, the system shall provide for radiological service and an onsite fuel supply for 72 hours of acute care operation.</p>

¹ For the purposes of NPC 2 and NPC 5, all enumerated items within Table 11.1 shall meet the requirements of Section 1632A of 2001 California Building Code (CBC) or equivalent provision in later version of the CBC by the specified timeframe as indicated by their respective NPC.

² For the purposes of NPC 3 and NPC 4, all enumerated items within Table 11.1 shall meet the requirements of the 1998 CBC, Section 1630B, by the specified timeframe. For the purposes of NPC 3R, all enumerated items within Table 11.1 shall meet the requirements of the 1995 CBC, Section 1630A, using $I_p=1.0$, by the specified timeframe.

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129850 & 130005(g)

CHAPTER 7. SAFETY STANDARDS FOR HEALTH FACILITIES

Article 1.0 General.

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Article 2. Definitions.

Unless otherwise stated, the words and phrases defined in this article shall have the meaning stated therein throughout Chapter 7, Part 1, Title 24.

7-111. Definitions.

"Addition" means any work which increases the floor or roof area or the volume of enclosed space of an existing building. ~~and is dependent on the structural elements of that facility for vertical or lateral support.~~

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~~**"Maximum probable earthquake"** means the maximum probable earthquake induced ground motion having a 10 percent probability of being exceeded in 50 years.~~

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"Office" means the Facilities Development Division within the Office of Statewide Health Planning and Development.

"Primary Gravity Load Resisting System (PGLRS)" means assembly of structural elements in the building that resists gravity loads, including floor and roof beams / girders supporting gravity loads or any other members designed to support significant gravity loads. Foundations supporting loads from the PGLRS shall be considered part of the PGLRS.

"Reconstruction" means the rebuilding of any "existing building" to bring it into full compliance with these regulations and all applicable parts of the California Building Standards Code.

"Seismic Force Resisting System (SFRS)" means assembly of structural elements in the building that resists seismic loads, including struts, collectors, chords, diaphragms and trusses. Foundations supporting loads from the SFRS shall be considered part of the SFRS.

... ..

"Structural repairs" means any change affecting existing or requiring new structural elements primarily intended to correct the effects of deterioration or impending or actual failure, regardless of cause.

~~**"Upper bound earthquake"** means the ground motion having a 10 percent probability of being exceeded in a 100-year period or maximum level of motion which may be expected at the building site within the known geological framework.~~

ARTICLE 3. Approval of Plans And Specifications

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7-117. Site Data.

(a) The site data reports shall be required for all proposed construction except:

1. As provided in the Part 2, Title 24.
2. One-story, wood-frame or light steel frame buildings of Type II or V construction and 4,000 square feet or less in floor area not located within Earthquake Fault Zones or Seismic Hazard Zones as shown in the most recently published maps from the California Geological Survey (CGS).
3. Nonstructural alterations.
4. Structural repairs for other than earthquake damage.
5. Incidental structural additions or alterations.

(b) Three copies of site data reports shall be furnished to the Office for review and evaluation prior to the submittal of the project documents for final plan review. Site data reports shall comply with the requirements of these regulations and Part 2, Title 24. Upon the determination that the investigation of the site and the reporting of the findings was adequate for the design of the project, the Office will issue a letter stating the site data reports are acceptable.

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7-125. Final Review of Plans and Specifications.

(a) One copy of the final plans and specifications and site data reports shall be submitted to the Office.

1. Two copies must be submitted if additions, structural alterations or new buildings are included.
2. The plans and specifications shall include: architectural, mechanical, electrical, structural seismic restraint, and fire and life safety details.

(b) Plans and specifications are to be completely and thoroughly checked by the responsible architect or engineer before submission to the Office. Plans and specifications which are incomplete or incorrect will be returned to the applicant.

1. Where a portion of the construction cannot be fully detailed on the approved plans because of variations in product design and manufacture, the approval of the plans for such portion may be deferred until the material suppliers are selected provided the following conditions are met:

- A. The plans clearly indicate that a deferred approval by the Office is required for the indicated portions of the work prior to fabrication and installation.
- B. The plans and specifications fully describe the performance and loading criteria for such work.
- C. The deferred approval submittals are made in conformance with Section 7-153.

Exception: Seismic Force Resisting System (SFRS), Primary Gravity Load Resisting System (PGLRS), and stairs shall not be deferred.

2. Due to the difficulty of anticipating every unsatisfactory condition that might exist in connection with the existing work where alteration or reconstruction work is proposed, the following clause or one of similar meaning shall be included in all specifications to which the Office gives approval in connection with either reconstruction or alteration work: "The intent of the plans and specifications is to reconstruct the hospital building in accordance with the California Building Standards Code, Titles 19 and 24, California Code of Regulations. Should any conditions develop not covered by the approved plans and specifications wherein the finished work will not comply with Title 24,

California Code of Regulations, a change order detailing and specifying the required work shall be submitted to and approved by the Office before proceeding with the work."

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Article 20. Repair of Earthquake Damage

7-300. Plan Review and Approval.

(a) All repair projects are subject to prior plan review, plan approval and construction permit by the Office except as noted in subsection (b).

(b) For emergency repairs carried out without the Office plan review and permit the aftermath of an earthquake, an application for plan review must be submitted with construction documents, fees and letter of transmittal stating the reasons for emergency repairs. Photographs, if available, and reports of damage and repairs should also be submitted with the application. Additional repairs may be required if the emergency repairs do not comply with the code. For alternate fee payment methodology, see Section 129787 of the Health and Safety Code.

(c) Plan reviews for earthquake damage repairs will be performed on a priority basis. The application for plan review should clearly state that the scope of the project is to repair the damage from the earthquake. Where possible, reviews will be made over the counter.

(d) Plan review fees shall be payable for all damage repair projects per the following:

1. 1.64 percent of estimated construction costs for hospitals.
2. 1.50 percent of estimated construction costs for skilled nursing facilities (SNF) or intermediate care facilities (ICF).
3. For alternate fee payment methodology, see Section 129787 of the Health and Safety Code.
4. An examination fee where review of existing plans is required. The fee will be calculated on a time and material basis at the prevailing hourly rates applicable for the review personnel.

7-301. Appeals. The Hospital Building Safety Board shall act as a board of appeals with regard to disagreements between the Office and hospital/SNF/ICF authorities on interpreting the repair policy or the establishment of the degree of damage. (Section 7-159 of Administrative Regulation for the Office)

7-302. Pre-1973 Structures.

These hospital buildings were approved for construction by local building departments prior to March 7, 1973.

(a) All structural repairs shall be made to conform to vertical load requirements of the California Building Code (CBC).

(b) Where lateral load resisting capacity of the building at any level is reduced by 5 percent or less due to earthquake damage, the repairs may be made with the same construction as before, subject to structural detailing requirements of the CBC.

(c) Where lateral load resisting capacity of the building at any level is reduced by more than 5 percent but not more than 10 percent due to earthquake damage, the repairs shall be made in accordance with Section ~~1635B.3.2.2~~ 3411A.3.2.2 of the CBC. ~~The repaired/reconstructed structural elements shall meet structural requirements using an importance factor of I = 1.0. The building after repairs shall be in reasonable compliance with the CBC using an importance factor, I, equal to 0.75.~~

(d) Where lateral load resisting capacity of the building at any level is reduced by more than 10 percent due to earthquake damage, the repairs shall be made such that the primary structural system and the seismic bracing of other components and systems shall conform to the requirements of Section ~~1635B.3.2.3~~ 3411A.3.2.3 of the CBC.

(e) Where earthquake repairs consist of alterations which involve removal of one or more entire stories, permission for repairs will be granted if lateral load resisting capacity of the remaining structure is not reduced. (Section ~~1635B.3.3~~ 3411A.3.2.4, CBC)

(f) Repair/reconstruction of structures should comply with the design and detailing requirements of engineering materials stated in Chapters ~~19~~ 19A, 20, ~~21~~ 21A, 22A and 23, as applicable, and applicable fire-resistive requirements of the CBC.

(g) Epoxy injection repairs shall require submittal of backup information per section 104.11, Appendix Chapter 1 of the CBC. ~~Chapter 16B, Section 1603B.7.~~

(h) Repair of damage to seismic anchorage of equipment and nonstructural items shall comply with Section 3403A.2.3 ~~4644B.13.4~~ of the CBC.

7-303. Post-1973 Structures.

These hospital structures were approved for construction by the Office of the State Architect or Office after March 7, 1973. They are also referred to in the regulations as approved existing buildings.

(a) Repairs to the damage shall be made to restore the load carrying capacities of the affected elements per Section 3411A.3.1 ~~4635B.3.4~~ of the CBC.

(b) Repair of damage to seismic anchorage of equipment and nonstructural items shall comply with Section 3403A.2.3 ~~4630B~~ of the CBC.

7-304. Type V Single Story SNF or ICF.

(a) All structural repairs shall be made to conform to vertical load requirements of the CBC.

(b) Repair of damage of seismic anchorage of equipment shall comply with the CBC.

(c) Where damage has reduced the lateral load capacity by more than 10% in any one line of the lateral force resisting system in the building, repairs of structural elements shall conform to Section 3403.2.3 of the CBC.

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129850 & 130005(g)

**EXPRESS TERMS
FOR PROPOSED BUILDING STANDARDS
OF THE
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

REGARDING PROPOSED CHANGES TO
CALIFORNIA BUILDING CODE
CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2, VOLUME 2**

LEGEND FOR EXPRESS TERMS

1. Existing California amendments or code language being modified: All such language appears in *italics*, modified language is underlined.
2. New California amendments: All such language appears *underline and in italics*.
3. Repealed text: All such language appears in ~~strikeout~~.

EXPRESS TERMS:

Chapter 16A - Structural Design

SECTION 1601A - GENERAL

1601A.1 Scope. The provisions of this chapter shall govern the structural design of buildings, structures and portions thereof regulated by this code.

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SECTION 1607A - LIVE LOADS

1607A.1 General. Live loads are those loads defined in Section 1602A.1.

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1607A.7 Loads on handrails, guards, grab bars, *shower seats, dressing room bench seats, and vehicle barriers*. Handrails, guards, grab bars and vehicle barriers shall be designed and constructed to the structural loading conditions set forth in this section.

1607A.7.1 Handrails and guards. Handrail assemblies and guards shall be designed to resist a load of 50 plf (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure. Glass handrail assemblies and guards shall also comply with Section 2407.

- Exceptions:**
1. For one- and two-family dwellings, only the single concentrated load required by Section 1607A.7.1.1 shall be applied.
 2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607A.7.1.1 Concentrated load. Handrail assemblies and guards shall be able to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building. This load need not be assumed to act concurrently with the loads specified in the preceding paragraph.

1607A.7.1.2 Components. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area equal to 1 square foot (0.093m²), including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of Section 1607A.7.1 or 1607A.7.1.1.

~~**1607A.7.1.3 Stress increase.** Where handrails and guards are designed in accordance with the provisions for allowable stress design (working stress design) exclusively for the loads specified in Section 1607A.7.1, the allowable stress for the members and their attachments are permitted to be increased by one third.~~

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SECTION 1614A - MODIFICATIONS TO ASCE 7

1614A.1 General. The text of ASCE 7 shall be modified as indicated in sections 1614A.1.1 through 1614A.1.31.

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1614A.1.3 ASCE 7, Table 12.2 -1. Modify ASCE 7 Table 12.2-1 as follows:

A. BEARING WALL SYSTEMS

14. Light-framed walls with shear panels of all other materials – Not permitted by OSHPD and DSA-SS.

B. BUILDING FRAME SYSTEMS

2. Steel eccentrically braced frames, non-moment-resisting connections at columns away from links - Not permitted by OSHPD.
4. Ordinary steel concentrically braced frames – Not permitted by OSHPD.
24. Light-framed walls with shear panels of all other materials – Not permitted by OSHPD and DSA-SS.
25. Buckling-restrained braced frames, non-moment-resisting beam-column connections – Not permitted by OSHPD.
27. Special steel plate shear wall – Not permitted by OSHPD.

C. MOMENT RESISTING FRAME SYSTEMS

2. Special steel truss moment frames – Not permitted by OSHPD.
3. Intermediate steel moment frames – Not permitted by OSHPD.
4. Ordinary steel moment frames – Not permitted by OSHPD.

Exception:

- 1) Systems listed in this section can be used as an alternative system when pre-approved by the enforcement agency.
- 2) Rooftop or other supported structures not exceeding two stories in height and 10 percent of the total structure weight can use the systems in this section when designed as components per ASCE 7 Chapter 13.
- 3) Systems listed in this section can be used for seismically isolated buildings when permitted by Section 1613A.6.2.

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)

Chapter 17A - Structural Tests and Special Inspections

1701A.1 Scope. The provisions of this chapter shall govern the quality, workmanship and requirements for materials covered. Materials of construction and tests shall conform to the applicable standards listed in this code.

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1704A.4 Concrete construction. The special inspections and verifications for concrete construction shall be as required by this section and Table 1704A.4.

TABLE 1704A.4 - REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	CBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1913A.4
2. Inspection of reinforcing steel welding in accordance with Table 1704A.3, Item 5b.	—	—	AWS D1.4 ACI 318: 3.5.2	—
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased <u>or design is based on Section 1912A</u> .	X	—	<u>ACI 318: Appendix D</u>	1911A.5 , <u>1912A</u>
4. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904A.2.2, 1913A.2, 1913A.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913A.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1913A.6, 1913A.7, 1913A.8
7. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	1913A.9
8. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X X	—	ACI 318: 18.20 ACI 318: 18.18.4	—
9. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
10. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
11. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—
12. Post-installed anchors.	X	—	—	—

For SI: 1 inch = 25.4 mm.

- a. Where applicable, see also Section 1707A.1, Special inspection for seismic resistance.

NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)

Chapter 18A - Soils and Foundations

1801A.1 Scope. The provisions of this chapter shall apply to building and foundation systems in those areas not subject to scour or water pressure by wind and wave action. Buildings and foundations subject to such scour or water pressure loads shall be designed in accordance with Chapter 16A.

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SECTION 1813A - PRESTRESSED ROCK AND SOIL FOUNDATION ANCHORS

1813A.1 General. The requirements of this section address the use of vertical rock and soil anchors in resisting seismic or wind overturning forces resulting in tension on shallow foundations.

1813A.2 Adoption. Except for the modifications as set forth in Sections 1813A.3 and 1813A.4, all Prestressed Rock and Soil Foundation Anchors shall be designed in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors.

1813A.3 Geotechnical Requirements. Geotechnical report for the Prestressed Rock & Soil Foundation Anchors shall address the following:

1. Minimum diameter and minimum spacing for the anchors including consideration of group effects.
2. Maximum unbonded length and minimum bonded length of the tendon.
3. Maximum recommended anchor tension capacity based upon the soil or rock strength / grout bond and anchor depth / spacing.
4. Allowable bond stress at the ground / grout interface and applicable factor of safety for ultimate bond stress.
5. Anchor axial tension stiffness recommendations at the anticipated anchor axial tension displacements, when required for structural analysis.
6. Minimum grout pressure for installation and post-grout pressure.
7. Class I Corrosion Protection is required for all permanent anchors. Geotechnical report shall specify the corrosion protection recommendations for temporary anchors.
8. Preproduction tests, Performance tests, Proof test and Creep test protocol, frequency and acceptance criteria. Performance test shall be at a minimum of 1.6 times the design loads. There shall be a minimum of two preproduction test anchors. Preproduction test anchors shall be tested to ultimate load or 0.80 times the specified minimum tensile strength of the tendon. A Creep test is required for all prestressed anchors with greater than 10 kips of lock-off prestressing load.

9. Lock-off prestressing load requirements.
10. Acceptable Drilling methods.
11. Geotechnical observation and monitoring requirements.

1813A.4 Structural Requirements.

1. Tendons shall be thread-bar anchors conforming to ASTM A 722.
2. The anchors shall be placed vertical.
3. Design Loads shall be based upon the load combinations in Section 1605A.3.1 and shall not exceed 60 percent of the specified minimum tensile strength of the tendons.
4. Ultimate Load shall be based upon Section 1614A.1.10 and shall not exceed 80 percent of the specified minimum tensile strength of the tendons.
5. The anchor shall be designed to fail in grout bond to the soil or rock before pullout of the soil wedge by group effect.
6. Foundation design shall incorporate the affect of lock-off loads.
7. Design shall account for as-built locations of soil anchors considering all the acceptable construction tolerances.
8. Design shall account for both short and long term deformation.
9. Enforcement agency may require consideration of anchor deformation in evaluating deformation compatibility or building drift where it may be significant.

NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)

Chapter 22A – Steel

2201A.1 Scope. The provisions of this chapter govern the quality, design, fabrication and erection of steel used structurally in buildings or structures.

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2205A.4 [For OSHPD 1 & 4] MODIFICATIONS TO AISC 341

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2205A.4.1.5 Part I, Section 13. Special Concentrically Braced Frames (SCBF) modifications

2205A.4.1.5.1 Part I, 13.2 Members, Add a new section as follows.

AISC 341, 13.2f. Member Types

The use of rectangular HSS are not permitted for bracing members, unless filled solid with cement grout having a minimum compressive strength of 3000 psi at 28 days. The effects

of composite action in the filled composite brace shall be considered in the sectional properties of the system where it results in the more severe loading condition or detailing.

2205A.4.1.5.2 Part I, Section 13: Add Section 13.7 as follows.

13.7 Beam to Column Connections.

SCBF frames shall have moment-resisting beam-column connections that can resist a moment equal to the lesser of the available flexural strength of the beam or the column in the SCBF bays. The connection shall include CJP welds from the beam flanges to the column flange, or to a plate in the case of column weak axis connections.

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)

CHAPTER 34 - EXISTING STRUCTURES

3401.1 Scope. The provisions of this Chapter shall control the alteration, repair, addition and change of occupancy of existing structures, *including state-regulated structures in accordance with Sections 3401.1.1 and 3401.1.2.*

.....

SECTION 3403 - ADDITIONS, ALTERATIONS OR REPAIRS

3403.1 Existing buildings or structures. Additions or alterations to any building or structure shall comply with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus additions shall comply with the height and area provisions of Chapter 5. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

.....

3403.2.3.3 Adoption [For OSHPD 2]: All additions, alterations, repairs and seismic retrofit to the existing structures or portions thereof may be designed and constructed in accordance with the provisions of ~~FEMA-356~~ ASCE 41, as modified herein.

3403.2.3.3.1 Referenced Standards. All Reference Standards listed in ~~FEMA-356~~ ASCE 41 shall be replaced by Referenced Standards listed in Chapter 35 of this code and shall include all amendments to the reference standards in this code.

3403.2.3.3.2 ~~FEMA-356~~ ASCE 41 Section 4.5 1.4 – Target Building Performance Rehabilitation Objectives. Target building performance level shall be Life Safety Building Performance Level (3-C) as defined in Section 1.5.3.3, ~~with Structural performance level S-3 as defined in Section 1.5.1.3 and Non-structural performance level N-C as defined in Section 1.5.2.3.~~ at Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in section 1.6.1.2 for Occupancy Category II Structures and Building Safety Objective (BSO) Level as defined in Section 1.4.1 for Occupancy Category III Structures.

3403.2.3.3.3 ~~FEMA-356~~ ASCE 41 Section 1.6 - Seismic Hazard. ~~The ground motion characterization shall be based on ground shaking having a 10 percent probability of exceedance in 50 years.~~

~~Ground shaking having a 10 percent probability of exceedance in 50 years need not exceed 2/3 of the maximum considered earthquake.~~

Response spectra and acceleration time histories shall be constructed in accordance with sections 1613, 1802.7 & 1802.8.

3403.2.3.3.4 Analysis Procedure. The selection of a particular analysis procedure from ~~FEMA 356~~ ASCE 41 may be subject to the approval of the enforcement agent.

3403.2.3.3.5 Design Criteria. Prior to implementation of ~~FEMA 356~~ ASCE 41 non-linear dynamic procedures – the ground motion, analysis and design methods, material assumptions and acceptance criteria proposed by the engineer shall be reviewed by the enforcement agent.

~~**3403A.2.3.3.6 Enforcement Agency Approval.** The analysis, conclusion and design decisions shall be reviewed and accepted by enforcement agent.~~

3403.2.3.3.6 3403A.2.3.3.7 Structural observation, testing and inspections. Construction testing, inspection and structural observation requirements shall be as required for new construction.

NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129850 & 130005(g)

Chapter 34A - Existing Structures

3401A.1 Scope. The provisions of this chapter shall control the alteration, repair, addition and change of occupancy of existing structures for applications listed in Sections 110.1 (OSHDP 1), and 110.4 (OSHDP 4) regulated by the Office of Statewide Health Planning and Development (OSHDP).....

SECTION 3402A DEFINITIONS

3402A.1 Definitions. The following term shall, for the purposes of this chapter and as used elsewhere in the code, have the following meaning. Definition provided in section 1613A.2, ASCE 7 section 11.2 and ~~Chapter 6 of Title 24 Part 1—Building Standards Administrative Code~~ ASCE 41 shall apply when appropriate in addition to terms defined in this section:

APPROVED EXISTING BUILDING. Any building originally constructed in compliance with the requirements of 1973 or subsequent edition of California Building Code.

ASSOCIATED STRUCTURAL ALTERATIONS means any change affecting existing structural elements or requiring new structural elements for vertical or lateral support of an otherwise nonstructural alteration.

~~**DESIGN** is the procedure that includes both the evaluation and retrofit design of an existing element and design of new element.~~

~~**DESIGN EARTHQUAKE** is the earthquake ground motion defined in section 3413A.2.2.~~

~~**ESSENTIAL LIFE SAFETY** is the retrofit or repair of a structure to a goal of essential life safety as a level of expected structural performance taken to mean that occupants will be able to exit the structure safely following an earthquake. It does not mean that they will be uninjured or not be in need of medical attention. A structure is presumed to achieve this level of performance where, although significant damage to the structure may have occurred, some margin against either total or partial structural collapse remains, even though damage may not be economical to repair; major structural elements have not become dislodged or fallen so as to pose a life safety threat; and, nonstructural systems or elements, which are heavy enough to cause severe injuries either within or outside the building, have not become dislodged so as to pose a life safety threat. This level of structural performance is equivalent to SPC-2.~~

GENERAL ACUTE CARE HOSPITAL as used in this chapter means a hospital building as defined in Section 129725 of the Health and Safety Code and that is also licensed pursuant to subdivision (a) of Section 1250 of the Health and Safety Code, but does not include these buildings if the beds licensed

pursuant to subdivision (a) of Section 1250 of the Health and Safety Code, as of January 1, 1995, comprise 10 percent or less of the total licensed beds of the total physical plant, and does not include facilities owned or operated, or both, by the Department of Corrections. It also precludes hospital buildings that may be licensed under the above mentioned code sections, but provide skilled nursing or acute psychiatric services only.

INCIDENTAL STRUCTURAL ALTERATIONS OR ADDITIONS are alterations or additions which would not reduce the story lateral shear force-resisting capacity by more than 5 percent or increase the story shear by more than 5 percent in any existing story.

~~**IMMEDIATE OCCUPANCY** – The retrofit or repair of a structure to a goal of immediate occupancy as a level of expected performance is taken to mean the post-earthquake damage state in which limited structural and non-structural damage has occurred. The original strength and stiffness of structure is substantially retained, with minor cracking and yielding of structural elements. Basic access and life safety systems, including doors, stairways, elevators, emergency lighting, fire alarms and suppression systems, remain operable, provided that utilities are available. It is expected that occupants could safely remain in the building, although normal use may be impaired and some clean-up, inspection and limited structural and non-structural repairs may be required. This level of expected structural performance is equivalent to SPC-3 through SPC-5.~~

MAJOR STRUCTURAL ALTERATIONS OR ADDITIONS are those alterations or additions of greater extent than minor structural alterations or additions.

MINOR STRUCTURAL ALTERATIONS OR ADDITIONS are alterations or additions of greater extent than incidental structural additions or alterations which would not reduce the story shear lateral-force-resisting capacity by more than 10 percent or increase base shear by more than 10 percent.

NONREQUIRED STRUCTURAL ALTERATION is any alteration of existing structural element or provision of new structural elements which is not necessary for vertical or lateral support of other work and is initiated by the applicant primarily for the purpose of increasing the vertical or lateral load-carrying strength or stiffness of an existing building.

NONSTRUCTURAL ALTERATION is any alteration which neither affects existing structural elements nor requires new structural elements for vertical or lateral support and which does not increase the lateral shear force in any story by more than 5 percent.

NPC 1, NPC 2, NPC 3 / NPC 3R, NPC 4 and NPC 5 NONSTRUCTURAL PERFORMANCE CATEGORY (NPC) are the building nonstructural performance categories for Hospital Buildings defined in Table 11.1 of California Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.

PEER REVIEW refers to procedure contained in Section 3414A.

PRIMARY FUNCTION. A primary function is a major activity for which the facility is intended. Areas that contain a primary function include, but are not limited to, the customer service lobby of a bank, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public accommodation or other private entity using the facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets, entrances, corridors and restrooms are not areas containing a primary function.

RECONSTRUCTION means rebuilding of any existing building to bring it into full compliance with these regulations.

REPAIR as used in this division means all the design and construction work affecting existing or requiring new structural elements undertaken to restore or enhance the structural and nonstructural load resisting system participating in vertical or lateral response of a structure primarily intended to correct the effects of deterioration or impending or actual failure, regardless of cause.

SPC 1, SPC 2, SPC 3, SPC 4 and SPC 5 STRUCTURAL PERFORMANCE CATEGORY (SPC) are the building structural performance categories for Hospital Buildings defined in Table 2.5.3 of California Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.

TECHNICALLY INFEASIBLE. An alteration of a building or a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

SECTION 3403A ADDITIONS, ALTERATIONS OR REPAIRS

3403A.1 Existing buildings or structures. Additions or alterations to any building or structure shall comply with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus additions shall comply with the height and area provisions of Chapter 5. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

3403A.1.1 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612A.3, any additions, alterations or repairs that constitute substantial improvement of the existing structure, as defined in Section 1612A.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

3403A.2 Structural. Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. Where repairs are made to structural elements of an existing building, and uncovered structural elements are found to be unsound or otherwise structurally deficient, such elements shall be made to conform to the requirements for new structures.

3403A.2.1 Existing live load. Where an existing structure heretofore is altered or repaired, the minimum design loads for the structure shall be the loads applicable at the time of erection, provided that public safety is not endangered thereby.

3403A.2.2 Live load reduction. If the approved live load is less than required by Section 1607A, the areas designed for the reduced live load shall be posted in with the approved load. Placards shall be of an approved design.

3403A.2.3 Seismic. Additions, alterations or modification or change of occupancy of existing buildings shall be in accordance with this section for the purposes of seismic considerations.

3403A.2.3.1 Additions to existing buildings. An addition that is structurally independent from an existing structure shall be designed and constructed with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic-force-resistance requirements for new structures unless the following conditions are satisfied:

1. The addition conforms with the requirements for new structures,
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 5 percent cumulative since the original construction, unless the element has the capacity to resist the increased forces determined in accordance with ASCE 7, and
3. Additions do not decrease the seismic resistance of any structural element of the existing structure by more than 5 percent cumulative since the original construction, unless the element has the capacity to resist the forces determined in accordance with ASCE 7. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

3403A.2.3.2 Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613A, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 5 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 5 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to ASCE 7 for a new

structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 and are initiated for the purpose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces conforming to ASCE 7, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16A.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16A.
5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3403A.2.3.3 Adoption. Except for the modifications as set forth in Sections 3411A through 3413A ~~3414A~~ all additions, alterations, repairs and seismic retrofit to existing structures or portions thereof may be designed and constructed in accordance with the provisions of ~~FEMA 356~~ ASCE 41.

3403A.2.3.3.1 Referenced Standards. All Reference Standards listed in ~~FEMA 356~~ ASCE 41 shall be replaced by Referenced Standards listed in Chapter 35 of this code and shall include all amendments to the reference standards in this code.

3403A.2.3.3.2 ASCE 41 Section 1.4 –Rehabilitation Objectives. Target building performance level shall be as follows:

- a. **For general acute care hospitals along with all structures required for their continuous operation and access** - Immediate Occupancy Structural Performance Level (S-1) as defined in Section 1.5.1.1 at Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in Section 1.6.1.2 and Collapse Prevention Structural performance level (S-5) per Section 1.5.1.5 at Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in Section 1.6.1.1. The nonstructural performance level shall satisfy the requirements of this code for new hospital buildings.

Exceptions: Buildings satisfying requirements of Sections 3403A.2.3.4, 3411A.2 or 3411A.3.

- b. **For pre-1973 Buildings which will not be used for general acute care services after January 1, 2030** - Building Safety Objective (BSO) Level as defined in Section 1.4.1. BSO level includes Life Safety Building Performance (3-C) Level as defined in Section 1.5.3.3 at the Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in section 1.6.1.2 and Collapse Prevention building performance level (5-E) per section 1.5.3.4 at the Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in section 1.6.1.1.

Exceptions: Buildings satisfying requirements of Sections 3403A.2.3.4, 3411A.3.2.1 and 3411A.3.2.2.

- c. **All Others** - Immediate Occupancy Building Performance Level of (1-B) as defined in Section 1.5.3.2 at Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in Section 1.6.1.2 and Collapse prevention building performance level (5-E) per Section 1.5.3.4 at Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in Section 1.6.1.1.

3403A.2.3.3.3 3403A.2.3.3.2 Material Testing Required. Use of Material Properties based on Historical Information as default values shall not be permitted.

3403A.2.3.3.4 3403A.2.3.3.3 Analysis Procedure. The selection of a particular analysis procedure from ~~FEMA 356~~ ASCE 41 shall be subject to the approval of the enforcement agent.

3403A.2.3.3.5 3403A.2.3.3.4 Design Criteria. Prior to implementation of ~~FEMA-356~~ ASCE 41 Nonlinear Dynamic Procedure, the ground motion, analysis and design methods, material assumptions and acceptance criteria proposed by the engineer shall be peer reviewed in accordance with Section 3414A and ~~or reviewed by the enforcement agent.~~

3403A.2.3.3.5 Enforcement Agency Approval. ~~The analysis, conclusion and design decisions shall be reviewed and accepted by the peer reviewer(s) and / or enforcement agent.~~

3403A.2.3.3.6 Structural observation, testing and inspections. Construction testing, inspection and structural observation requirements shall be as required for new construction.

3403A.2.3.4 Seismic Evaluation and Retrofit of General Acute Care Hospitals. Notwithstanding any other requirements of this code, all existing general acute care hospitals shall comply with the requirements specified in Chapter 6, Part 1, Title 24.

3403A.2.3.4.1 SPC5 and NPC 4 / NPC5. Structures and nonstructural components and systems satisfying the requirements of this Code for new buildings for Occupancy Category IV shall be considered to satisfy the requirements of SPC 5 and NPC 4. NPC 4 buildings satisfying operational requirements for NPC 5 of Table 11.1, Chapter 6, Part 1, Title 24, shall be placed in non-structural performance category NPC 5.

3403A.2.3.4.2 SPC 5 using ASCE 41. Structures satisfying the requirements of immediate occupancy structural performance level (S-1) per Section 1.5.1.1 of ASCE 41 at BSE-1, Collapse prevention performance level S-5 per section 1.5.1.5 of ASCE 41 at BSE-2 and items identified in Chapter 10, Part 1, Title 24, satisfying the requirements of Immediate Occupancy Nonstructural performance level (N-B) per section 1.5.2.2 of ASCE 41 at BSE-1 shall be considered to comply with SPC 5 requirements of Table 2.5.3, Chapter 6, Part 1, Title 24.

3403A.2.3.4.3 SPC 2 using ASCE 41. Structures satisfying the requirements of life safety structural performance level (S-3) per section 1.5.1.3 of ASCE 41 at BSE-1 and items identified in Chapter 10, Title 24, Part 1 satisfy the requirements of life safety Nonstructural performance level (N-C) per section 1.5.2.3 of ASCE 41 at BSE-1, shall be considered to comply with SPC 2 requirements of Table 2.5.3, Chapter 6, Part 1, Title 24.

3403A.2.4.4 NPC. Non-structural components for Immediate Occupancy Nonstructural performance level (N-B) in section 1.5.2.2 shall meet the requirements of this Code for new buildings. Non-structural components for Operational Nonstructural performance level (N-A) in section 1.5.2.1 shall meet performance level N-B and Section 3413A.1.30. Building satisfying the requirements of non-structural performance level N-A and N-B as described in this section shall be considered to satisfy the requirements of NPC 5 & NPC 4 of Table 11.1, Chapter 6, Part 1, Title 24 respectively.

Immediate Occupancy Nonstructural performance level (N-B) in Section 1.5.2.2 and Life Safety Nonstructural performance level (N-C) in section 1.5.2.3 of ASCE 41 at BSE-1 shall be considered equivalent to NPC 3 / NPC 2 and NPC 3R requirements respectively of Table 11.1, Chapter 6, Part 1, Title 24. For NPC 3 / NPC 3R / NPC 2, only components listed in Table 11.1, Chapter 6, Part 1, Title 24, for NPC 3 / NPC 3R / NPC 2 need to satisfy the requirements specified above.

Exceptions: 1) Evaluation procedure in Article 11, Chapter 6, Part 1, Title 24 shall be used for seismic evaluation of NPC 2, NPC 3 / NPC 3R, NPC 4 and NPC 5, where specific procedure is not outlined in ASCE 41. Administrative and permitting provisions outlined in Article 11, Chapter 6, Part 1, Title 24 shall apply.

2) Anchorage and bracing of nonstructural components in buildings in seismic performance categories SPC 1 and SPC 2 with a performance level of NPC 3R may comply with the provisions of Section 1630A of the 1995 California Building Code using an importance factor $I_p=1.0$. The capacity of welds, anchors and fasteners shall be determined in accordance with requirements of this Code.

3) Anchorage and bracing of nonstructural components in buildings in seismic performance categories SPC 1 or SPC 2 with a performance level of NPC 3 or higher, and SPC 3 or SPC 4, may comply with the provisions of Section 1630B of the 1998 California Building Code using an

importance factor $I_p=1.5$. The capacity of welds, anchors and fasteners shall be determined in accordance with requirements of this code.

A continuous load path of sufficient strength and stiffness between the component and the supporting structure shall be verified. Local elements of the supporting structure shall be verified for the component loads where they control the design of the elements or their connections. Increases in F_p due to anchorage conditions (for example shallow anchors) need not be considered. For NPC 3R, the adequacy of load path for nonstructural elements need only be verified when the total reaction at the point of support (including the application of F_p) exceeds the following limits:

1. 250 pounds for components or equipment attached to light frame walls. For the purposes of this requirement, the sum of the absolute value of all reactions due to component loads on a single stud shall not exceed 250 pounds.
2. 1,000 pounds for components or equipment attached to roofs, or walls of reinforced concrete or masonry construction.
3. 2,000 pounds for components or equipment attached to floors or slabs-on-grade.

Exception: If the anchorage or bracing is configured in a manner that results in significant torsion on a supporting structural element, the effects of the nonstructural reaction force on the structural element shall be considered in the anchorage design.

3403A.2.3.5 Repair of Earthquake Damage. Repair of Earthquake Damage shall comply with Article 20, Chapter 7, Part 1, Title 24.,

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SECTION 3411A - ADDITIONS, ALTERATIONS, REPAIRS AND SEISMIC RETROFIT TO EXISTING BUILDINGS OR STRUCTURES

Existing hospital buildings (as defined in Section 7-111 Part 1, Title 24, Building Standards Administrative Code).

NOTE: Alterations to lateral shear force-resisting capacity and story lateral shear forces shall be considered to be cumulative for purposes of defining incidental or minor alterations or additions. The percentage of cumulative changes shall be based on as built conditions existing on March 7, 1973 or since the original construction if built after March 7, 1973.

3411A.1 Alterations. For this section, alterations include any additions, alterations, repairs, and / or seismic retrofit to a hospital building or portions thereof. The provision of Section 3403A shall apply for Hospital Buildings.

3411A.2 Seismic Retrofit. Any seismic retrofit of hospital building required by Article 2 and Article 11, Chapter 6, Part 1, Title 24, shall meet the requirements of Sections 3403A.2.3.4, ~~3412A through 3414A.~~

EXCEPTION: Hospital buildings evaluated to SPC 1 due to deficiencies identified by Article 10, Chapter 6, Part 1, Title 24, may be upgraded to SPC 2 by altering, repairing or seismically retrofitting these conditions in accordance with the requirements of Sections 3403A.2.3., ~~3412A through 3414A.~~

3411A.3 Alterations, additions and repairs to existing buildings or structures not required by Chapter 6, Part 1, Title 24.

3411A.3.1 Approved existing buildings. Structural alterations or repairs may be made to approved building provided the entire building, as modified, including structural alterations or repairs, conform to Sections 3403A.2.3, ~~3412A through 3414A~~ except that requirements for the seismic structural performance category (SPC) of the building as determined by Chapter 6, Part 1, Title 24 shall apply. Additions shall conform to the requirements of these regulations for new construction.

3411A.3.2 Pre-1973 buildings.

3411A.3.2.1 Incidental structural alterations, additions or repairs. The existing structural elements affected by the alteration, addition or repair shall conform or shall be made to conform to the vertical load

requirements of these regulations. Incidental structural additions will be permitted provided the additions meet these regulations for new construction using importance factor, *I*, equal to or greater than 1.0. Alterations or repairs to the existing lateral load-resisting system must meet the requirements of Sections 3403A.2.3, 3412A through 3414A.

3411A.3.2.2 Minor structural alteration, additions or repairs. Minor structural alterations, additions or repairs shall be permitted provided they meet the following: Alterations to existing gravity and / or lateral load-resisting systems shall be made to conform to the requirements of Sections 3403A.2.3, 3412A through 3414A; and ~~or~~ additions shall meet all of the requirements of these regulations for new construction using an importance factor, *I*, equal to or greater than 1.0.

3411A.3.2.3 Major structural alteration, additions or repairs. Major structural alterations, additions or repairs shall be permitted provided the entire building, as modified, including the structural alterations or repairs, conforms to the requirements of Sections 3403A.2.3, 3403A, 3412A through 3414A for no less than SPC-2. Additions shall meet the requirements of these regulations for new construction.

It shall also be demonstrated by a written report submitted by the structural engineer, acceptable to the enforcement agency, that an investigation of the existing building structure shows it to be constructed in a reasonable conformance with the submitted drawings and specifications.

3411A.3.2.4 Removal of Stories. An alteration which involves the removal of one or more entire stories will be permitted if the lateral-load-resisting capacity of the remaining structure is not reduced.

An alteration which involves the removal of other than one or more entire stories will be permitted provided that entire building conforms to in accordance with Sections 3403A.2.3, 3412A through 3414A.

SECTION 3412A RESERVED EARTHQUAKE EVALUATION AND DESIGN FOR RETROFIT OF EXISTING HOSPITAL BUILDINGS

3412A.1 Purpose. All modifications, alterations, and / or repairs to existing structures or portions thereof shall, at a minimum, be designed and constructed to resist the effects of seismic ground motions as provided in this section. When applicable, the structural system shall be evaluated by the design professional of record and, if not meeting or exceeding the minimum seismic design requirements of this section, shall be retrofitted in compliance with these requirements.

3412A.1.1 Minimum seismic design. The purpose of this section is to provide a minimum level of seismic performance. At this essential life safety level (seismic performance category, SPC - 2), in general, persons in and around the building will be able to safely exit or be evacuated from the building or its vicinity following an earthquake. It does not mean that persons will not be injured or not be in need of medical attention. This level of seismic performance is presumed to be achieved when a) the building has some margin against either total or partial collapse of the structural system even though significant damage may have occurred that may not be economical to repair; b) major structural elements have not fallen or been dislodged so as to pose a life safety threat; and c) nonstructural systems or elements that are heavy enough to cause severe injuries either within or outside the building have not been dislodged so as to pose a life safety threat. For buildings in seismic performance categories SPC - 3 through SPC - 5, the purpose of this section is to provide the immediate occupancy level of seismic performance. At this level, the building and essential non-structural systems will be reasonably capable of functioning following an earthquake.

3412A.2 Applicability

3412A.2.1 The requirements of this section apply to hospital building where Chapter 6, Part 1, Title 24 Building Standard Administrative Code, so requires, wherever the structure is to be retrofitted, repaired, or modified and; 1) there is change in occupancy; or 2) changes to structural elements that reduce the lateral load capacity by more than 5% at any story; or 3) repair of structural elements where the damage has reduced the lateral load capacity by more than 10% at any story; or 4) changes in live or dead load that increase the story shear by more than 5%; or 5) where required by Sections 3403A, 3411A or Chapter 6, Part 1, Title 24, Building Standard Administrative Code. Changes in items 2), 3), and 4) are cumulative for past alterations to the building.

Where items 1 through 5 are not applicable, the alteration, retrofit or repair shall meet the requirements of this section, but upgrade of the whole structure is not required.

3412A.2.2 Evaluation required. ~~If the criteria in Section 3412A.2.1 apply to the project under consideration, the design professional of record shall provide an evaluation in accordance with FEMA 356, as modified herein, to determine the seismic performance of the building in its current configuration and condition. If the structure seismic performance is evaluated as satisfactory and enforcement agent concur, then no structural retrofit is required.~~

EXCEPTION: ~~In some cases a technical review and evaluation may be waived under the exception of Section 3413A.1, where the life safety threat posed by building is clearly minimal.~~

3412A.2.3 Retrofit required. ~~Where the evaluation indicates the building does not meet the SPC performance objective of this section, the owner shall take appropriate steps and either 1) undertake the seismic retrofit as part of the modifications, alterations and / or repairs; or 2) provide a plan, acceptable to the enforcement agent, to complete the seismic retrofit in a timely manner.~~

3412A.3 ~~The modification to any existing building may be prepared in accordance with the requirements of a new building in this Code.~~

3412A.4 ~~The structural system allowances of Sections 3403A.2.1 & 3403A.2.2 do not apply to any building to which Sections 3411A through 3414A apply.~~

SECTION 3413A SEISMIC REHABILITATION OF BUILDINGS MODIFICATIONS TO ASCE 41

3413A.1 GENERAL. ~~The existing or retrofitted structure shall be demonstrated to have the capability to sustain the deformation response due to the specified earthquake ground motions. The engineer shall provide an evaluation of the response of the existing structure in its current configuration and condition to the ground motions specified. If the building's seismic performance is evaluated as satisfactory and the enforcement agent concurs, then no further engineering work is required. When the evaluation indicates the building does not meet the objective of safety goals of this chapter and the applicable structural seismic performance (SPC) and nonstructural seismic performance (NPC) requirements, then a retrofit and / or repair design shall be prepared that yields a structure that meets the life safety and operational performance objectives of Section 3412A and reflects the appropriate consideration of existing conditions. Any approach to analysis and design may be used that yields a building of reliable stability in the prescribed design earthquake loads and conditions. The approach shall be rational, shall be consistent with the established principals of mechanics, and shall use the known performance characteristics of materials and assemblages under reversing loads typical of severe earthquake ground motions.~~

EXCEPTION: ~~Further consideration of the structure's seismic performance can be waived by the Enforcement Agent if both the engineer of record and Enforcement Agent conclude that the structural system can be expected to perform at least as well as required by the provisions of Section 3403A, 3412A through 3414A without completing an analysis of the structure's conformance to these requirements. A detailed report shall be submitted to the responsible Enforcement Agent that presents the reasons and basis for this conclusion. This report shall be prepared by the engineer of record. Enforcement Agent shall concur in this conclusion and affirm to it in writing.~~

3413A.2 Modifications to FEMA 356. ~~This section is applicable to seismic evaluation, analysis and design using the provisions of FEMA 356 per section 3403A.2.3.3. The text of FEMA 356 ASCE 41 shall be modified as indicated in sections 3413A.2.1 3413A.1.1 through 3413A.2.37 3413A.1.32.~~

Reference to sections of International Building Code (IBC) in ASCE 41 shall comply with requirements of Sections 110.1 & 110.4.

3413A.1.1 ASCE 41 Section 1.1. Modify ASCE 41 Section 1.1 with the following:

Seismic evaluations shall be performed using procedure and criteria of ASCE 41 except for general acute care hospitals, which shall be evaluated per Chapter 6, Part 1, Title 24 when required per provision of that chapter.

3413A.2.1 FEMA 356 Sections 1.3, 1.4, 1.5. ~~Replace FEMA 356 Sections 1.3, 1.4 and 1.5 as follows:~~

Seismic Rehabilitation Process and Objective. ~~Seismic evaluation procedure, building performance level and rehabilitation objectives for Hospital Buildings shall be per California Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.~~

3413A.2.2 3413A.1.2 FEMA 356 ASCE 41 Section 1.6 Seismic Hazard. ~~Replace FEMA 356~~ Modify ASCE 41 Section 1.6 with the Following:

~~The ground motion characterization shall be based on ground shaking having a 10 percent probability of exceedance in 50 years for category SPC-2 at the essential life-safety performance level. For SPC-3 through SPC-5, the ground motion characterization shall be based on ground shaking having a 10 percent probability of exceedance in 50 years at the immediate occupancy performance level and the maximum considered earthquake at the collapse prevention performance level.~~

~~Ground shaking having a 10 percent probability of exceedance in 50 years need not exceed 2/3 of the maximum considered earthquake.~~

~~Response spectra and acceleration time histories shall be constructed in accordance with Sections 1613A, 1614A and 1802A.6. Basic Safety Earthquake 2 (BSE-2) in ASCE 41 shall be same as Maximum Considered Earthquake (MCE) in ASCE 7.~~

3413A.2.3 3413A.1.3 FEMA 356 ASCE 41 Section 2.2.6. ~~Modify FEMA 356~~ ASCE 41 Section 2.2.6 with the Following:

Data Collection Requirements. ~~The extent of data collection shall be at Usual level for SPC-2 and Comprehensive level for all structures except that data collection at Usual level shall be permitted for structures with BSO or lower target performance objective. SPC-3 through SPC-5 per FEMA 356 Table 2-1. Materials properties testing program shall be pre-approved by the Enforcement Agent.~~

~~For building, built under an OSHPD permit based on 1976 or later edition of CBC, where materials properties are shown on design drawings and original materials test data are available, no materials testing shall be required when approved by the enforcement agent.~~

3413A.2.4 3413A.1.4 FEMA 356 ASCE 41 Section 2.4.1.1. ~~Modify FEMA 356~~ ASCE 41 Section 2.4.1.1 with the Following:

~~**Method to Determine Limitations on Use of Linear Procedures.** The applicability of linear procedures shall be determined as follows:~~

- ~~• If all component DCRs ≤ 1.5 for SPC-3 through 5 buildings or 2.0 for SPC-2 buildings, then linear procedures are applicable.~~
- ~~• If up to 10% of the component DCRs exceeds 1.5 and no irregularities described in Sections 2.4.1.1.1 through 2.4.1.1.4 are present, then linear procedures are applicable.~~
- ~~31. If one or more component DCRs exceed 1.5 for the Immediate Occupancy Structural Performance Level (S-1) or 2.0 for the Life Safety Structural Performance level (S-3) and any irregularity described in Section 2.4.1.1.1 through 2.4.1.1.4 is present, then linear procedures are not applicable and shall not be used.~~
- ~~42. Linear procedures are not applicable to moment resisting frames where plastic hinges do not form in either the beam at the face of column or in the column panel zone.~~

3413A.2.5 3413A.1.5 FEMA 356 ASCE 41 Section 2.4.2.1 ~~Modify FEMA 356~~ ASCE 41 Section 2.4.2.1 with the following:

Nonlinear Static Procedure. ~~If higher mode effects are significant, either the Nonlinear Dynamic Procedure or Modal Pushover Analysis procedure, subject to the approval of the enforcement agent, shall be used.~~

3413A.2.6 3413A.1.6 FEMA 356 ASCE 41 Section 2.4.4.5. ~~Modify FEMA 356~~ ASCE 41 Section 2.4.4.5 by the Following:

Material Properties. ~~Expected material properties are not permitted to be determined by multiplying lower bound values by the assumed factors specified in Chapters 5 through 8.-~~

3413A.2.7 3413A.1.7 FEMA 356 ASCE 41 Section 3.2.10.1. Modify FEMA 356 ASCE 41 Section 3.2.10.1 with the Following:

Linear Procedures. Equation 3-6 3-5 is not permitted by OSHPD.

3413A.2.8 FEMA 356 Section 3.3.1.3.1. Modify FEMA 356 Section 3.3.1.3.1 by the Following:

~~Pseudo Lateral Load.~~

~~C_2 = Modification factor to represent the effects of pinched hysteresis shape, stiffness deterioration and strength deterioration on maximum displacement response. Values of C_2 for different framing systems and Structural Performance Levels shall be obtained from Table 3-3. For linear procedures, C_2 may be taken as 1.0 if all DCRs are less than 1.5.~~

3413A.2.9 3413A.1.8 FEMA 356 ASCE 41 Section 3.3.1.3.5. Replace FEMA 356 ASCE 41 Section 3.3.1.3.5 as follows:

Unreinforced Masonry Buildings. Unreinforced Masonry not permitted by OSHPD.

3413A.1.9 ASCE 41 Section 3.3.3.2.2 Modify ASCE 41 Section 3.3.3.2.2 with the following:

Simplified NSP Analysis. Not permitted by OSHPD.

3413A.2.10 FEMA 356 Section 3.3.3.2.4. Modify FEMA 356 Section 3.3.3.2.4 by the Following:

~~**Idealized Force-Displacement Curve.** The effective yield strength, V_y , and yield displacement of the building shall not be used to determine acceptance criteria based on displacement ductility or strength beyond the provisions without approval of the enforcement agent.~~

3413A.2.11 FEMA 356 Section 3.3.3.3.2. Modify FEMA 356 Section 3.3.3.3.2 by the Following:

~~Target Displacement.~~

~~C_2 = Modification factor to represent the effects of pinched hysteresis shape, stiffness deterioration and strength deterioration on maximum displacement response. Values of C_2 for different framing systems and Structural Performance Levels shall be obtained from Table 3-3.~~

3413A.2.12 FEMA 356 Table 3-3. Modify FEMA 356 Table 3-3 by the Followings:

Values for Modification Factor C_2 .

~~Footnote 1. Structures in which more than 30% of the story shear at any level is resisted by any combination of the following components, elements, or frames: ordinary moment resisting frames, concentrically braced frames, frames with partially restrained connections, tension-only braces, unreinforced masonry walls, shear critical piers and spandrels of reinforced concrete or masonry, flexurally controlled reinforced concrete and masonry walls without boundary elements and welded steel special moment resisting frames with Pre-Northridge connections.~~

3413A.2.13 3413A.1.10 FEMA 356 ASCE 41 Section 3.4.2.2. Modify FEMA 356 ASCE 41 Section 3.4.2.2 with the Following:

Acceptance Criteria for Linear Procedures – Drift Limitations. The interstory drift ratio shall not exceed the following values for the specified systems for the performance level under consideration drift limits for Occupancy Category IV in ASCE 7 Table 12.12-1 due to forces corresponding to BSE-1, except that buildings designed to BSO or lower performance levels are permitted to meet the drift limits for Occupancy Category II. For dual systems, the least interstory drift ratio shall control.

EXCEPTION: Larger interstory drift ratios shall be permitted where justified by rational analysis that both structural and non-structural elements can tolerate such drift and approved by the enforcement agent.

Seismic Force	IO	LS	CP
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Resisting System			
Moment Frames	0.015	0.020	0.025
Braced Frames	0.010	0.015	0.020
Shear Walls	0.007	0.010	0.015

3413A.2.14 3413A.1.11 FEMA 356 ASCE 41 Section 3.4.3.2.1. Modify FEMA 356 ASCE 41 Section 3.4.3.2.1 with the following:

Deformation-Controlled Actions. For any building required to meet the SPC-3 through SPC-5 Operational Building Performance level, 1-A or Immediate Occupancy Building Performance Level, 1-B, primary components shall be within the acceptance criteria for primary components and secondary components shall be within the acceptance criteria for secondary components.

3413A.2.15 3413A.1.12 FEMA 356 ASCE 41 Section 4.4. Modify FEMA 356 ASCE 41 Section 4.4 with the followings:

Foundation Strength and Stiffness. Foundation and soil strength shall be used to evaluate potential overturning, uplift and sliding for fixed base assumptions, and stiffness for flexible base assumptions, including deformations associated with those actions.

3413A.2.16 3413A.1.13 FEMA 356 ASCE 41 Section 4.4.1.1. Replace FEMA 356 ASCE 41 Section 4.4.1.1 as follows:

Presumptive Capacities. Not permitted by OSHPD

3413A.2.17 3413A.1.14 FEMA 356 ASCE 41 Section 4.4.1.2. Replace FEMA 356 ASCE 41 Section 4.4.1.2 as follows:

Prescriptive Expected Capacities. Not permitted by OSHPD.

3413A.2.18 3413A.1.15 FEMA 356 ASCE 41 Section 4.4.3.2.2. Modify FEMA 356 ASCE 41 Section 4.4.3.2.2 with the following:

Flexible Base Assumption. The soil strength shall be evaluated.

3413A.2.19 3413A.1.16 FEMA 356 ASCE 41 Section 4.5. Modify FEMA 356 ASCE 41 Section 4.5 with the following:

Seismic Earth Pressure. Where the grade difference from one side of the building to another exceeds one-half story height, the seismic increment of earth pressure shall be added to the gravity lateral earth pressure to evaluate the building overturning and sliding stability and the lateral force resisting system below grade in combination with the building seismic forces .

3413A.2.20 3413A.1.17 FEMA 356 ASCE 41 Table 5.6. Modify FEMA 356 ASCE 41 Table 5.6 with the following:

Acceptance Criteria for Nonlinear Procedures - Structural Steel Components.

For fully and partially restrained moment connections designed to 1989 or prior edition of Part 2, Title 24 shall be verified for the presence of welds using E70T-4 electrodes. Where E70T-4 electrodes are present, the plastic rotation angles and residual strength ratios used shall be substantiated by the statistical analysis of three or more applicable cyclic test results subject to the approval of the enforcement agent. ,except when connections satisfy requirements of AISC 358.

3413A.2.21 3413A.1.18 FEMA 356 ASCE 41 Section 6.8.1.4 6.7.1.1. Modify FEMA 356 ASCE 41 Section 6.8.1.4 6.7.1.1 with the following:

Monolithic Reinforced Concrete Shear Walls and Wall Segments. For nonlinear procedures, shear walls or wall segments with axial loads greater than 0.35 P_o shall be included in the model as primary elements with appropriate strength and stiffness degrading properties assigned to those components subject to the approval of the enforcement agent. For linear procedures, the effects of deformation compatibility shall be investigated using moment-curvature section analyses and cyclic testing results of similar components to

determine whether strengthening is necessary to maintain the gravity load carrying capacity of that component.

~~3413A.2.22 FEMA 356 Section 6.8.2.3 6.7.2.3.~~ Modify FEMA 356 Section 6.8.2.3 ~~6.7.2.3~~ with the following:

~~Strength.~~ The effective tension and compression flange widths for shear walls or wall segments shall be taken as one half of the distance to the next wall web or 25% of the total wall height, whichever is less.

~~3413A.2.23 3413A.1.19 FEMA 356 ASCE 41 Section 7.4.2 7.3.2.~~ Replace FEMA 356 ASCE 41 Section 7.4.2 ~~7.3.2~~ as follows:

Unreinforced Masonry Walls and Piers In-plane. Not permitted by OSHPD.

~~3413A.2.24 3413A.1.20 FEMA 356 ASCE 41 Section 7.4.3 7.3.3.~~ Replace FEMA 356 ASCE 41 Section 7.4.3 ~~7.3.3~~ as follows:

Unreinforced Masonry Walls Out-of-plane. Not permitted by OSHPD.

~~3413A.2.25 3413A.1.21 FEMA 356 ASCE 41 7.4.4.2.2 7.3.4.2.2.~~ **Shear Strength of Walls and Piers.** Modify FEMA 356 ASCE 41 Section ~~7.4.4.2.2 7.3.4.2.2~~ with the following:

The spacing of shear reinforcing, S , shall be less than or equal to the wall pier clear height divided by 2 or the story height divided by 2, whichever is smaller.

~~3413A.2.26 FEMA 356 Section 8.3.2.5.~~ Modify FEMA 356 Section 8.3.2.5 with the following:

~~Default Properties.~~ Component construction in the building shall be verified to meet the material properties, including fastener size and spacing used in the test assemblies establishing the expected strength and stiffness values given in Tables 8-1 and 8-2.

~~3413A.2.27 FEMA 356 Sections 8.5.4.3, 8.5.5.3, 8.5.6.3, 8.5.7.3, 8.5.8.3, 8.5.9.3, 8.5.10.3, 8.5.11.3, 8.5.12.3, 8.5.13.3, 8.5.14.3, 8.5.15.3, 8.5.16.3, 8.5.17.3, 8.6.3.3, 8.6.4.3, 8.6.5.3, 8.6.6.3, 8.6.7.3, 8.6.8.3, 8.6.9.3, 8.6.10.3, 8.7.2, 8.8.1.3.~~ Modify FEMA 356 Sections listed by the following:

~~Acceptance Criteria.~~ Component construction in the building shall be verified to meet the material properties, including fastener size and spacing used in the test assemblies establishing the m -factors and displacement ductility values given in Tables 8-3 and 8-4.

~~3413A.2.28 3413A.1.22 FEMA 356 ASCE 41 Section 9.2.4.~~ Modify FEMA 356 ASCE 41 Section 9.2.4 with the following:

Linear Procedures. Verification of the interstory lateral displacements, isolator displacements, the strength adequacy of the seismic force resisting system and isolation system, and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

~~3413A.2.29 3413A.1.23 FEMA 356 ASCE 41 Section 9.2.5.1.~~ Modify FEMA 356 ASCE 41 Section 9.2.5.1 with the following:

Nonlinear Static Procedure. Verification of the interstory lateral displacements, isolator displacements, the strength adequacy of the seismic force resisting system and isolation system, and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

~~3413A.2.30 3413A.1.24 FEMA 356 ASCE 41 Section 9.2.9.~~ Modify FEMA 356 ASCE 41 Section 9.2.9 with the following:

Isolation System Testing and Design Properties - Production Tests. Production testing and associated acceptance criteria shall be as approved by the enforcement agent.

~~3413A.2.31 3413A.1.25 FEMA 356 ASCE 41 Section 9.2.9.2.9.~~ Modify FEMA 356 ASCE 41 Section 9.2.9.2.9 with the following:

Testing Similar Units. The testing exemption shall require approval by the enforcement agent.

~~3413A.2.32 3413A.1.26 FEMA 356 ASCE 41 Section 9.3.4.~~ Modify ~~FEMA 356 ASCE 41~~ Section 9.3.4 with the following:

Linear Procedures. Verification of the interstory lateral displacements, damper relative velocities and displacements, the strength adequacy of the seismic force resisting system and damping system, and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

~~3413A.2.33 3413A.1.27 FEMA 356 ASCE 41 Section 9.3.5.1.~~ Modify ~~FEMA 356 ASCE 41~~ Section 9.3.5.1 with the following:

Nonlinear Static Procedure. Verification of the interstory lateral displacements, damper relative velocities and displacements, the strength adequacy of the seismic force resisting system and damping system, and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

~~3413A.2.34 3413A.1.28 FEMA 356 ASCE 41 Section 9.3.8.~~ Modify ~~FEMA 356 ASCE 41~~ Section 9.3.8 with the following:

Required Tests of Energy Dissipation Devices - Production Tests. Production testing and associated acceptance criteria shall be as approved with the enforcement agent.

~~3413A.2.35 3413A.1.29 FEMA 356 ASCE 41 Chapter 10.~~ Replace ~~FEMA 356 ASCE 41~~ Chapter 10 as follows:

Simplified Rehabilitation. Not permitted by OSHPD.

~~3413A.2.36 FEMA 356 Section 11.1.~~ Modify ~~FEMA 356~~ Section 11.1 with the following:

~~Scope.~~ ~~The seismic rehabilitations of nonstructural components and system shall satisfy the requirements of Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.~~

~~3413A.2.37 FEMA 356 Section 11.2.~~ Modify ~~FEMA 356~~ Section 11.2 by the following:

~~Procedure.~~ ~~The seismic rehabilitations objective shall be to satisfy the Nonstructural Performance Requirements of Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.~~

3413A.1.30 ASCE 41 Section 11.3.2. Modify ASCE 41 Section 11.3.2 with the following:

Operational Nonstructural Performance Level (N-A) Requirements. All Structures shall meet Immediate Occupancy Nonstructural Performance Level (N-B) and facility shall have on-site supplies of water and holding tanks for wastewater, sufficient for 72 hours emergency operations, are integrated into the building plumbing systems. As an alternative, hook-ups to allow for the use of transportable sources of water and sanitary waste water disposal have been provided. An on-site emergency system as defined within Part 3, Title 24 is incorporated into the building electrical system for critical care areas. Additionally, the system shall provide for radiological service and an onsite fuel supply for 72 hours of acute care operation.

3413A.1.31 ASCE 41 Section 11.9.4.3.1. Modify ASCE 41 Section 11.9.4.3.1 with the following:

Ceilings in all Categories shall satisfy requirements for ceilings in Category C specified in this section.

3413A.1.32 ASCE 41 Section 11.10.2.4. Modify ASCE 41 Section 11.10.2.4 by the following:

For general acute care hospital, Nonstructural Evaluation shall comply with requirements of Section 11.2, Chapter 6, Part 1, Title 24.

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)

CHAPTER 35 - REFERENCED STANDARDS

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.4, *Appendix Chapter 1*.

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ASCE/SEI		American Society of Civil Engineers Structural Engineering Institute 1801 Alexander Bell Drive Reston, VA 20191-4400
Standard reference number the	Title	Referenced in code section number
41-06	<i>Seismic Rehabilitation of Existing Buildings</i>	<u>3403.2.3, 3403A.13,</u> <u>3415.5, .415.6, 3415.8,</u> <u>3417.2, 3417.5, 3417.7,</u> <u>3417.9</u>

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FEMA		Federal Emergency Management Agency Federal Center Plaza 500 C Street S.W. Washington, DC 20472
Standard reference number	Title	Referenced in code section number
FEMA 356	<i>Prestandard and Commentary for the Seismic Rehabilitation of Buildings</i>	3403.2.3.3, 3403A.2.3.3, 3403A.13

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PTI		Post-Tensioning Institute 1717 W. Northern Avenue, Suite 114 Phoenix, AZ 85021
Standard reference Number	Title	Referenced in code section number
<u>PTI-2004</u>	<u><i>Recommendations for Prestressed Rock and Soil Anchors (4th Edition)</i></u>	<u>1813A.1</u>

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NOTATION:

- Authority: Health and Safety Code Section 130005(g) & 130021
- Reference: Health and Safety Code Section 1275, 129790, 129850 & 130005(g)